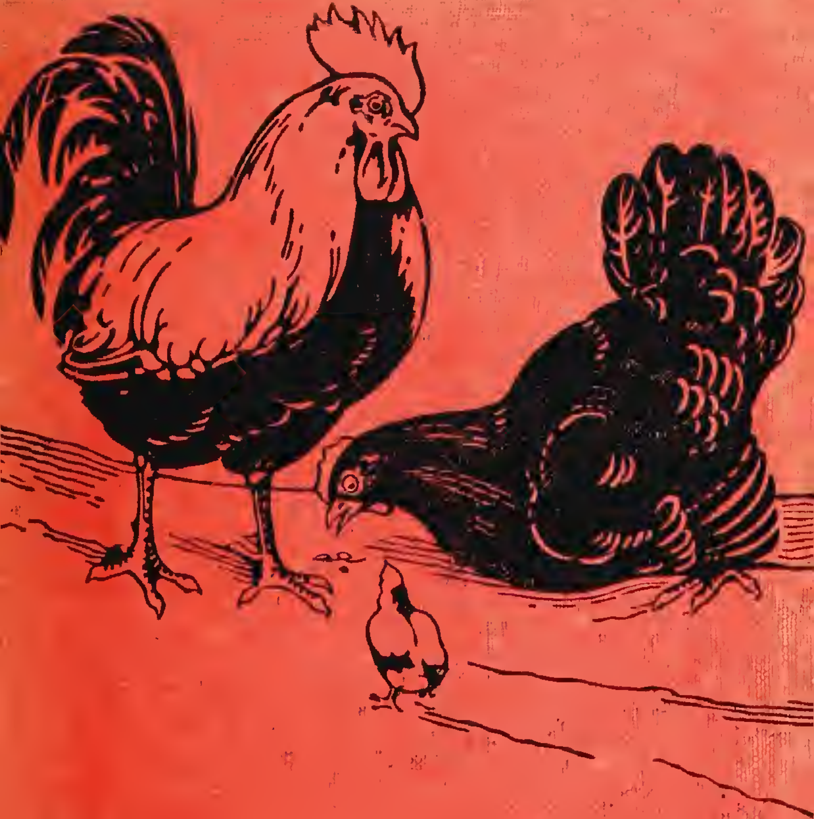

POULTRY FOR PROFIT

E. T. BROWN

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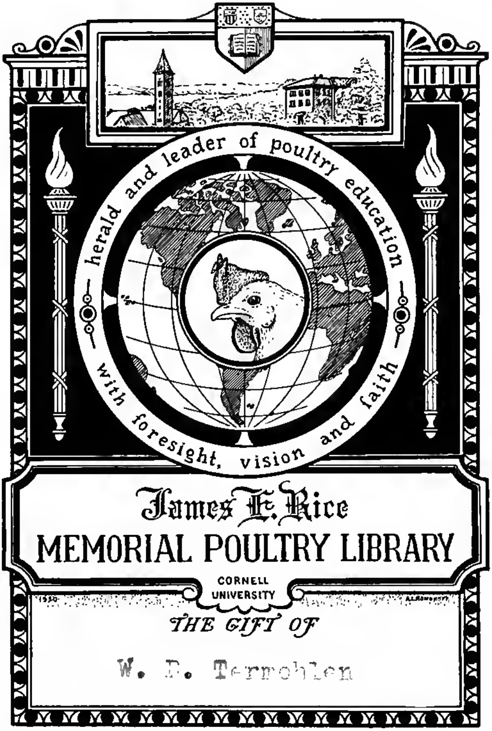
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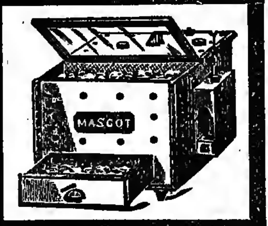

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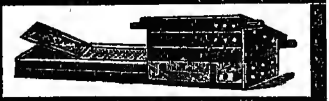

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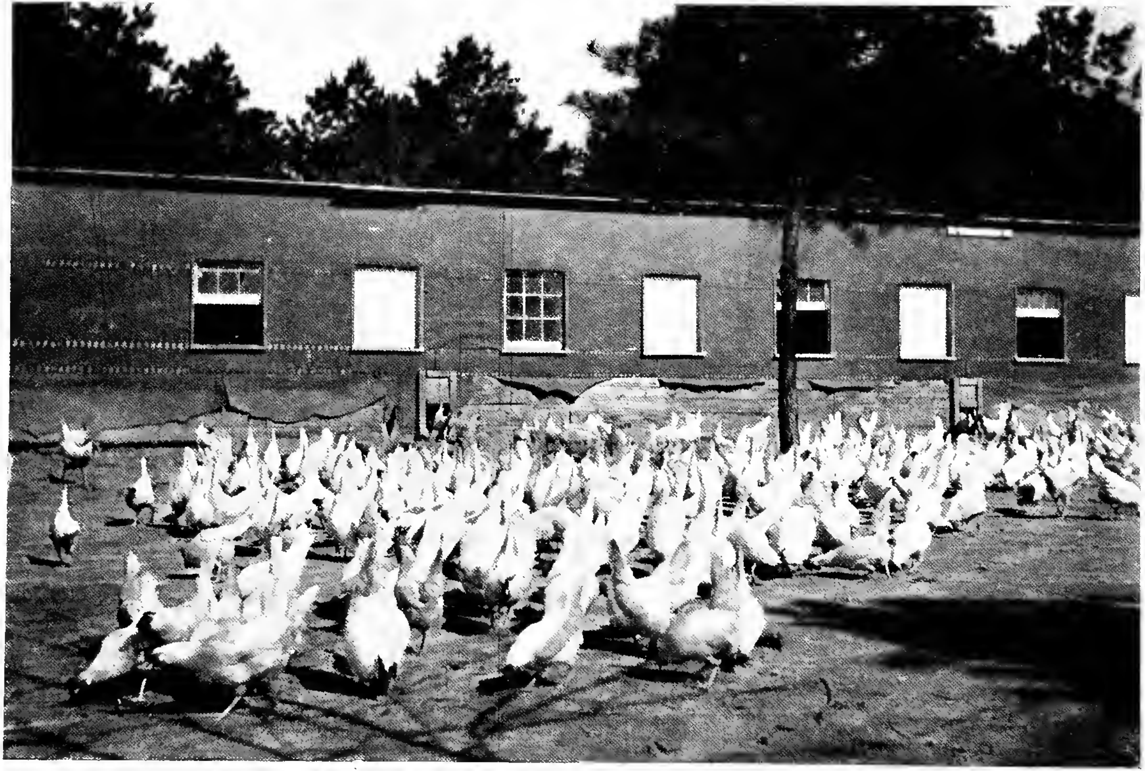

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E. T. BROWN

AUTHOR OF "PROFITABLE POULTRY KEEPING FOR SMALLHOLDERS," "DUCKS, GEESE, AND TURKEYS," "1000 ANSWERS TO 1000 QUESTIONS," "FARM TRACTORS," "HOME MADE POULTRY APPLIANCES," ETC.

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POULTRY KEEPING

CHAPTER I

A NATIONAL INDUSTRY

IN 1916 the President of the Board of Agriculture estimated that the consumption value of eggs and poultry in the United Kingdom was £35,000,000 per annum. Vast though that sum is, it represents little more than 15s. per head of the population per annum. This amount includes home produce and imports, inclusive of liquid and dried eggs used largely for confectionery and manufacturing processes, as well as the expenses and profits of distribution.

It does not, however, state the complete case, for the sum named fails to take into account the value of manure produced by poultry, which is a very important item, especially in view of the high prices of fertilisers and the fact that where birds are at liberty distribution is most effective and in the finest state for enriching the soil. A low estimate is that on the farms, smallholdings and allotments of this country, poultry manure produced is in value at least £3,000,000 per annum.

According to the estimate of Mr. Edward Brown, F.L.S., in his annual summary of the poultry industry, in the year before the war (1913), the production values of eggs and poultry in the United Kingdom was £14,000,000, without the manure contributed to the land, and the imports £10,545,000. In 1916, by reduction of imports and increased prices, the figures were: home products, £22,400,000; imports, inclusive of liquid eggs, £6,770,000. Thus whilst British supplies had increased by 60 per cent, imports had decreased by 36 per cent.

THE FARMER AND SMALLHOLDER

Of greater interest and importance is the value of the poultry industry to individuals. Some branches of farming and of live stock are open to the few and denied to the many, by reason of the extent of land required, the amount of capital involved, the period of waiting before the crop, whatever it may be, is gathered or the stock reaches the stage when it can be sold with the maximum of profit, or the long intervals when no money is coming in. Poultry, more especially fowls and ducks, occupy a totally different position. With respect to these experience has abundantly shown:—

1. That there is scarcely any section of the community that is unable to contribute to the national food supply in the shape of eggs and poultry, ranging from the farmer with his larger areas, the smallholder and allotment keeper to the suburban resident and the backyarder in towns and manufacturing districts.

2. That the amount of capital involved is comparatively small. Where houses and other appliances are built and made on the spot and rough material is used, the cost is low. Also, as fowls reproduce themselves rapidly and mature quickly, the numbers can be increased speedily and with small monetary expenditure. From a foundation pen of ten hens and a male bird 100 to 150 laying pullets can be raised within a few months.

3. That by effective management, when once laying has commenced, returns are constant. Not a few smallholders have proved in practice that they are able to sell from £2 worth of eggs and chickens weekly all the year round, as well as supply their own households.

4. That there is a constant and profitable outlet for eggs and poultry in every part of the country, which will continue to an increasing extent when the war is over. This is because overseas supplies will never attain the same volume as in the past, and prices will never fall again to former rates.

5. That where fowls form part of the operations and can be given liberty of range, which should always be the case wherever possible, and thus form a rotation with cultivation, they find a considerable part of their food by foraging, so that the cost of production is low. They turn much that would be otherwise wasted into money.

6. That pullets of the right breeds, if raised under favourable conditions, can be brought into lay within twenty-six to thirty weeks from the time the eggs from which they emanate are laid, and that chickens can be marketed in good condition in fifteen to eighteen weeks, and ducklings in thirteen to fifteen weeks from the setting of eggs.

The poultry industry, therefore, offers a field to nearly everyone. Apart from the question of manuring the land, which is dealt with in the next chapter, farmers and their families can add considerably to the returns upon their farms if and when they are willing to give the necessary time and thought and care to this branch of their operations. This has been abundantly proved. Many farmers' wives for years have earned in this way from £50 to £100 per annum, the larger part of which was net profit. Four to five times as many poultry could be kept as farm stock in Great Britain than is now done, in which case our requirements as to this class of food would be fully met. The case of smallholders is dealt with more fully in a later chapter, but it is enough to say that the same is true of this very important class of cultivator.

THE SMALL MAN

Generally speaking, the poultry industry is the branch of live stock which offers the fullest opportunity to those who regard it as supplemental to the ordinary sources of income. It is none the less welcome in that respect. A country cottager whose wage is 40s. per week, can, if the opportunity be afforded him, make a profit of 10s. to 15s. per week by his poultry. This would mean an increase of 25 to 37½ per cent to his income.

The artisan, as shown especially in East Lancashire and the West Riding of Yorkshire, is able by poultry on his allotment to double the amounts stated, and in his spare time.

Even the backyarder, to whom profit is of less importance than food supply, can meet the requirements of his family at a lower cost than if purchased, while there is no relationship as to quality of eggs obtained in this manner, as compared with those which are usually bought in the shops.

WHERE THE SMALLHOLDER SCORES

In all countries, our own as well as others, relative production of eggs and poultry is greater upon smallholdings and allotments than where the area of land in occupation is greater. This is, to a large extent, a question of management. Poultry require regular attention. They cannot be placed out on range and left to themselves as many larger stock whose productivity is limited to a short period of the year. That is emphasised by the fact that eggs must be collected at least every day, just as a cow is milked twice every twenty-four hours, for which cause both these animals and hens must be within easy reach.

At the same time, there is no reason why even the larger farms should not vastly increase the stock of poultry kept. To do this effectively and successfully what is known as the colony method should be adopted, as explained in Chapter IV, by which some farmers are maintaining profitably thousands of laying hens where they had only scores under the old homestead system. For such operations arable is better than pasture land.

BREEDING ESTABLISHMENTS

Another branch which offers considerable opportunities as an entire or partial source of income, but which requires skill and patience, is that of breeding poultry farms. At these the stock produced must be carefully selected for vigour of constitution and prolificacy in eggs or flesh. Just as the farmer and horticulturist goes to the seed grower or nurseryman for seeds or plants or trees, so does the ordinary poultry-keeper look to the breeder to supply him with what he requires. Thousands of such businesses have been established within recent years, contributing largely to that marked improvement in the poultry kept throughout the country within the two last decades. Some of these are on a large scale, doing an extensive business, and demanding all the time and attention of the owners. Others are modest, but render in combination an equal service, and when run as an additional means of income are very profitable. In addition are the hatching plants, from which vast numbers of day-old chicks are sent out every season. Replacements as required can be made by the purchase of mature stock, or by eggs for hatching or chicks, to supply which breeding farms are necessary.

The poultry industry is open to men and women of every class, offering adequate rewards to those who are prepared to meet its demands in time and labour and thought. It permits no indolence, no neglect. It pays well those who deserve success. What more can we expect ?

CHAPTER II

POULTRY ON THE SMALLHOLDING

THE full measure of success in running a smallholding is determined by intensification of method, and by the extent to which animal and plant life are in perfect balance. A smallholding is not a large farm in miniature, for in that case the returns would be insufficient. Unless the land is systematically and regularly supplied with manure the crops will be relatively small, and many waste products that can be transformed into valuable human food will be entirely lost.

Poultry meet the smallholder's requirements and are amenable to his control more than any class of live stock. They are also inexpensive, and by the rapidity with which they reproduce themselves a considerable stock can be obtained in a short period of time. They are speedily and continuously productive, and eggs and birds are always in demand at paying rates.

THEIR VALUE AS FERTILISERS

The manurial value of poultry has not been adequately recognised, though many farmers have remarked the steadily and greatly improved fertility of land as a result of this class of stock. Twenty-five to thirty fowls will produce in twelve months a ton of moist manure, the cash value of which, under present conditions, is from 35s. to 48s., especially where it falls direct upon the soil. No cheaper and more effective method of enhancing the fertility of the soil is to be met with than running fowls thickly over it as a preparation for cropping. In this way poor soils have been made productive, and good soils improved greatly, whether the land be in pasture or arable or under garden crops or where fruits are planted. At the same time, a large number of weeds and non-edible plants, as well as grub and insect life, are eaten by the fowls, which is not the case with any of the larger stock. A bird's beak enables it to pick from the ground what escapes an animal.

The addition of manure to soil is undesirable and harmful unless crops are grown to utilise and thus turn it into money. The great danger of over-stocking continuously is that the soil becomes so impregnated as to be little better than a manure heap. Much disease and heavy loss in poultry has arisen from this cause alone. Hence, the imperative need of distribution over the land so that the manure added is fully and completely used up every season, or by a system of rotation in which each area is only occupied by poultry one year out of three or four. An acre of pasture land can probably use a couple of tons of moist poultry manure every year. Therefore, if more than fifty to sixty birds are kept upon it, so will there arrive a time when it will have to rest. Two hundred birds may be placed upon an acre of fresh, sweet, grass land for one year. In that case it must be free from fowls for three seasons.

Arable land, dug or ploughed, will maintain twice the number stated, because the cropping is heavier and more intensive, utilisation of manure proceeding at a rapid rate. There are two ways in which this can be carried out; first, placing the fowls on the ground between crops and removing when planting takes place, or second, the colony system described in Chapter IV. The latter has many advantages, chief of which are that it forms a regular rotation and that the fowls are able largely to support themselves. As a suggestion, the following rotation for arable land is made :—

First year	. Fowls, 200 to 400 per acre.
Second year	. Corn.
Third year	. Roots or potatoes.
Fourth year	. Forage plants, clover, lucerne or vegetables.
Fifth year	. Fowls again, and so on.

On grass land the occupation by fowls is one year out of three or four.

VARIOUS SYSTEMS OF HOUSING

Whether the method adopted be that known as distributive, in which the houses are as widely scattered as possible in accordance with the cultivation, or on the colony system, the house or hut selected should practically be the same, that is one which can be readily removed. In the former case one upon wheels or runners is preferable, as change of position should be more frequent. In the latter a bogie as sleigh or with wheels, on which the entire house can be placed, will be sufficient. To that end a house holding twenty-five birds—that is, about 6 feet by 8 feet square—is preferable. A useful and cheap form is that known as the Sussex ark, which practically serves all purposes. With it separate nest-boxes are placed outside.

Where egg production is the main object, as is frequently the case, a very useful building is a scratching shed for winter layers on semi-intensive lines. Hens are found to be more productive during the colder period of the year if kept under these conditions than if at full liberty. The cost of feeding is higher, but the eggs are then at their maximum value. Such a shed should be open-fronted (see Chapters VIII and IX), be well ventilated—3½ square feet of floor space allowed for each inmate. Thus a shed 30 feet long by 12 feet wide will accommodate ninety to a hundred hens, affording abundance of room for perches, nests and scratching litter. Hens out on range during the spring, summer and early autumn can be brought in before the advent of winter. Such a house will also be most useful for rearing chickens after the hens are removed.

EGG PRODUCTION

Generally, except under special conditions noted below, egg production offers the greatest opportunity to smallholders, as demand is so constant and supplies inadequate. To maintain regularity of supply is the chief difficulty. Such should be secured if possible by the plan named above, and by including as part of the flock those breeds which are naturally heavier in body and better winter layers than the non-sitters.

In those districts where are to be found fattening establishments a profitable branch is the hatching and rearing of chickens for sale at twelve to fourteen weeks old. Under such circumstances one of the table breeds should be selected, and by commencing hatching as early as eggs are available a succession of young birds until June or early July will be secured. This is equally true in the neighbourhood of residential centres and holiday resorts. For successful growth of chickens a warm soil is essential.

While homestead methods—that is, keeping the poultry around a farmyard, where they find a large amount of food—may be adopted, not more than twenty-five birds should be kept. Any beyond that number should be distributed over the land in accordance with what has already been stated.

CHAPTER III

CLIMATE, SOIL AND POSITION

In selecting the most suitable variety of poultry with which to stock the farm, the smallholding or the backyard there are many extremely important considerations to bear in mind. One of the most urgent things to consider, of course, is the purpose which the poultry-keeper has in view. Utility fowls are divided into three classes—the laying, the table, and the general purpose. If the poultry-keeper wants to specialise in chickens for the table obviously he would be making a serious mistake to choose one of the laying or non-sitting varieties. This is so apparent, however, that the point need not be further emphasised.

But there is another consideration which has a very important bearing upon the results achieved, and that is the question of soil, climate and position. Yet this is a matter which is very seldom given proper thought and attention. I have many and many a time seen a smallholder struggling vainly to rear a delicate breed of chickens upon a soil that was totally unfitted and a location that was merely encouraging ill-health.

When the Britisher is blamed for his slackness in the production of eggs and poultry—and he has been very slack indeed—he almost invariably trots forward as an excuse the statement that the conditions, climatic and otherwise, are against him. The reason why the foreigner, he will tell you, has secured so firm a grip on our markets is because he is blessed with far more favourable climatic conditions.

Like many another excuse, however, this particular one will not hold water. There are perhaps a few especially favourable spots abroad, but it is a curious thing that more often than not it happens that in such places poultry keeping is neglected as much as it has been in this country.

Speaking generally, and this is all we can do, it is just as easy to produce eggs in England as it is in Italy, or table chickens in Scotland or Ireland as it is in France.

THE QUESTION OF CLIMATE

There are many countries in the world where poultry keeping flourishes, but where the climatic conditions are much less favourable than is the case in Great Britain. We do not experience the same extremes between winter and summer. In the United States, for instance, the winters are far more severe than they are in this country, while the summers are much hotter.

To say that Denmark and Russia, the countries from which we obtain our greatest supplies of eggs, have a better climate than our own is sheer nonsense. France and Italy, both of which send huge quantities of eggs to Great Britain, are much less advantageously situated, so far as climate is concerned, than we are.

The fact of the matter is that with the possible exception of North-west France there is no part of the Northern Hemisphere which is so favourably placed climatically as the United Kingdom.

HOT SUMMERS A DRAWBACK

It is a great mistake to imagine, as many do, that intensely hot summers are advantageous. This is certainly not the case, for the smaller the extremes between summer and winter the better. Scorching summers mean parched pastures and very little growth in the arable land. To take only one example of the drawbacks of very hot summers, I may point out that the extreme heat of summer in South Europe accounts for the small size and poor quality of South European fowls under ordinary conditions.

A great deal more could be written on this question, for I have not touched upon the effect of moisture or variations of climate, but enough has been said, I think, to show that the United Kingdom is very favourably situated so far as climate is concerned.

THE NATURE OF THE SOIL

The soil also plays an important part in the health and prolificacy of fowls. Very seldom is this factor regarded by the poultry-keeper, yet it has a great bearing upon the results achieved as well as upon the particular variety selected. Whenever one is selecting a breed for a certain locality the nature of the soil should be taken into consideration. Speaking generally, it may be taken for granted that white-fleshed fowls thrive best on light soils, that those with grey flesh and legs do best on medium soils, and that those with yellow legs and flesh prove most satisfactory on clay soils.

The least satisfactory kind of soil for poultry is sand, for it contains so little animal or vegetable life. Any soil which is not good enough to grow plant life is not of much use for poultry.

WHERE NON-SITTERS THRIVE

The non-sitting breeds of poultry are our most prolific layers. They are small-bodied birds, active, generally hardy, poor in table properties, and rapid growers. As the name implies the hens never, or very rarely, sit. All lay white-shelled eggs.

Nature of soil.	*The best breeds.*
Clay . . .	White, brown or buff Leghorn. Ancona. Redcap.
Medium . . .	Black Minorca. Andalusian. Houdan.
Gravel . . .	Any non-sitting variety.

THE TABLE BREEDS

The breeds belonging to this class are celebrated for their edible qualities. They are deep-breasted, small-boned, and carry a large amount of meat on the wings and breast.

Nature of soil.	*The best breeds.*
Clay . . .	No table variety thrives well on clay soil.
Medium. . .	Faverolles. Indian Game. Sussex.
Gravel . . .	Dorking. Game. Sussex. Any of the French breeds.

THE GENERAL PURPOSE VARIETIES

The breeds belonging to this class combine egg producing with edible qualities. The hens are quiet sitters and reliable mothers. The chickens grow fairly quickly, and, generally speaking, are hardy. General purpose fowls are the best winter layers we have. All the eggs are tinted and of a medium size.

Nature of soil.	*The best breeds.*
Clay . . .	Wyandotte. Plymouth Rock. Light Brahma.
Medium. . .	Wyandotte. Plymouth Rock. Langshan. Orpington.
Gravel . . .	Any of the above breeds

CHAPTER IV

THE SYSTEMS OF POULTRY KEEPING

THERE are three distinct systems of housing poultry in vogue at the present time, each of which possesses certain advantages and certain drawbacks. The three systems are: 1. The Colony House plan; 2. The House and Run plan; and 3. The Intensive plan.

THE COLONY HOUSE PLAN

The chief advantages of this system over the other two are reduced capital expenditure; economy of food; increased health; and the benefit to the land.

The saving in capital expenditure is very considerable. Not only is the house itself less expensive, but there is a great economy in the way of gates, wire-netting and posts. The question of expense is, in fact, one of the chief drawbacks to the method of permanent houses and runs. For most breeds six-foot wire netting is needed to keep them within bounds, and to make even a smallish run costs a good deal. Added to this there is the expense of posts and gates. All this is dispensed with when the colony system of housing is adopted. The only outlay in this case is the house itself. Portable houses are comparatively cheap to make, though in this connection it should be pointed out that it is false economy to buy or build too cheap a structure. A portable house must be built strongly, for otherwise the constant removal, often over rough ground, puts a great strain upon the framework.

THE FOOD BILL REDUCED

The problem of feeding is largely solved when fowls are given free range. Those who have never actually tried the plan will scarcely credit the enormous saving in the food bill that can be effected by allowing fowls their liberty.

Often and often I have kept a flock of fowls—both growing chickens and laying hens—for several months on one meal a day, while several times no food has been provided at all for two or three weeks. And yet at the end of the period they have been in equally good, sometimes better, condition than other fowls which had been kept in confinement and given two or three meals a day!

To secure the full benefit of the colony system of housing the fowls should be given very little artificial food. It stands to reason that if they are supplied with all the corn and meal they want, they will become lazy and they won't try and obtain their own living. Why should they, when they can procure food without working for it? Fowls are no different to human beings in this respect.

Common-sense must be used in this connection. If the weather be very dry and the land parched, or if the soil is a very poor one, where there is but little animal and vegetable life, fowls can't support themselves. During several months of the year, too, growth in the soil is almost at a standstill, and during this time the fowls' natural diet must be generously augmented.

HEALTH AND MANURE

Fowls enjoying their freedom undoubtedly are healthier and more vigorous than those confined in a run. I am not suggesting for a moment that when fowls are confined in a run they are unhealthy. Far from it. But there is no doubt whatever that when they are permitted to roam at will about the fields, whether arable or pasture, they are vigorous, and their constitutions are hardier and more robust.

A larger percentage of the eggs is fertile from fowls at liberty than from those in a confined space. More than this, the germs in the fertile eggs are stronger and produce more robust stock.

Last, but by no means least, there is the great benefit the land derives. One of the great difficulties to be faced when confining fowls in runs is to maintain the land pure and sweet. Tainted soil is the bugbear of the man whose space is limited. But pure soil is of such vital importance to the health and well-being of the fowls that no effort must be considered too great to insure it. It can be done, of course, but ceaseless care is necessary.

When the portable house system is adopted all this difficulty is overcome. So long as the house is regularly and systematically moved from one place to another—the work of only a few moments—there is no danger whatever of the soil becoming impure.

Just the reverse is the case. The manure being distributed over a wide area, instead of all falling upon a few square yards, the land benefits enormously. I have often seen a piece of poor land converted into an excellent pasture within the space of a few years as a direct result of the presence of fowls.

THE HOUSE AND RUN PLAN

When space is somewhat restricted it is impossible to adopt the colony plan of housing, and one of the other two methods must be selected. If there is room to provide a run, I certainly recommend this being done, especially when there is sufficient space to maintain it in grass. When fowls are enjoying a free range it is not possible permanently to keep more than about fifty fowls to the acre. By a good system of runs it is possible to keep six times this number, and, provided that a good system is adopted, this may be done without any danger of the ground becoming sour—perhaps the greatest difficulty against which the poultry-keeper has to contend.

When fowls are housed in portable sheds scattered far and wide about the fields a considerable amount of labour is necessary in feeding them and in their management generally. They have to be liberated first thing in the morning, the eggs have to be collected once or twice a day, while someone has to go round again the last thing at night to close the trap-doors. This all entails a considerable amount of work, particularly when the houses are far afield. In the case of permanent houses and runs the poultry are all near together, and they can be looked after with considerably less labour.

Great progress has been made during the last few years so far as the use of trap-nests is concerned, and in building up a laying strain their employment is absolutely necessary. Under the portable house system, it is practically impossible to use trap-nests, because the nests have to be visited every few hours in order to collect the eggs and liberate the hens.

A minor advantage of keeping fowls in confinement is that they are so much tamer than when they are at liberty. This is a point that is of more importance, perhaps, to the fancier than to the utilitarian; but, at the same time, I think that tame hens are usually more prolific than those which are wild.

Another distinct benefit to be derived from keeping fowls in runs is that when several varieties are kept there is little fear of their getting mixed up. This is a most essential point when producing stock birds or eggs for hatching purposes. When several pens are running loose in the same or adjoining fields, even though they are some distance away from each other, there is always a likelihood that the birds may get mixed up, with disastrous effects on the breeding results.

THE INTENSIVE SYSTEM

When space is so limited that it is impossible to provide even a run for the fowls the intensive system should be adopted. This consists in providing a scratching-shed only, the fowls never being liberated at all.

The greatest and most striking advantage possessed by the intensive system of poultry keeping is that by its means the number of fowls maintained in this country can be so enormously increased. The possibilities in this direction are unlimited. In the past to be a successful poultry-keeper space was required; under the intensive system practically no land whatever is needed, for a cock and five hens occupy only about 6 feet by 4 feet.

In its entirety this system is still on trial. I do not doubt for a moment, in fact I know from experience, that from the point of view of egg production alone this system is successful. There is, however, another aspect of which we have to take note. As yet no one has successfully kept fowls on the intensive system, renewing one half of the stock each year by the introduction of intensively reared birds and, moreover, birds which are the progeny of intensively kept stock. This, in my opinion, constitutes the one drawback to the system. It is absolutely essential to secure new layers from an outside source if the high average of the egg yield is to be maintained. If the limits of the system are respected it can be recommended.

BREEDING STOCK AND CONFINEMENT

I have always held the opinion that to insure the hardiest and most satisfactory chickens the breeding stock should have their freedom, or, at any rate, their comparative freedom. If they have a large grass run, this is almost as good as complete liberty. But stock birds in a small garden run rarely, if ever, throw such good stock, and this is where the great drawback to the intensive method lies.

I think it will probably prove quite satisfactory in the case of layers (whose eggs are for consumption), growing stock, and, of course, fattening birds ; but until many years have gone and I have been conclusively convinced to the contrary, I should hesitate to recommend this plan for stock birds.

The plan that I advise is to buy either sittings of eggs or young chickens, rear them under these intensive methods, and retain the pullets as layers, renewing the stock in this way every year. By this system a great deal may be accomplished.

Among other points which must be considered are initial cost and labour. Both of these are of necessity somewhat heavy. At the same time, the initial cost would ultimately be repaid by the saving in space, and this to the man who occupies but a small area of land is an important consideration.

Labour at first sight appears rather heavy, but not when it is taken into account that the houses can be placed quite near together. When fowls are living in portable sheds, scattered about the holding, or even in houses and runs, the labour and time taken in feeding and attending to the birds is by no means inconsiderable.

CHAPTER V

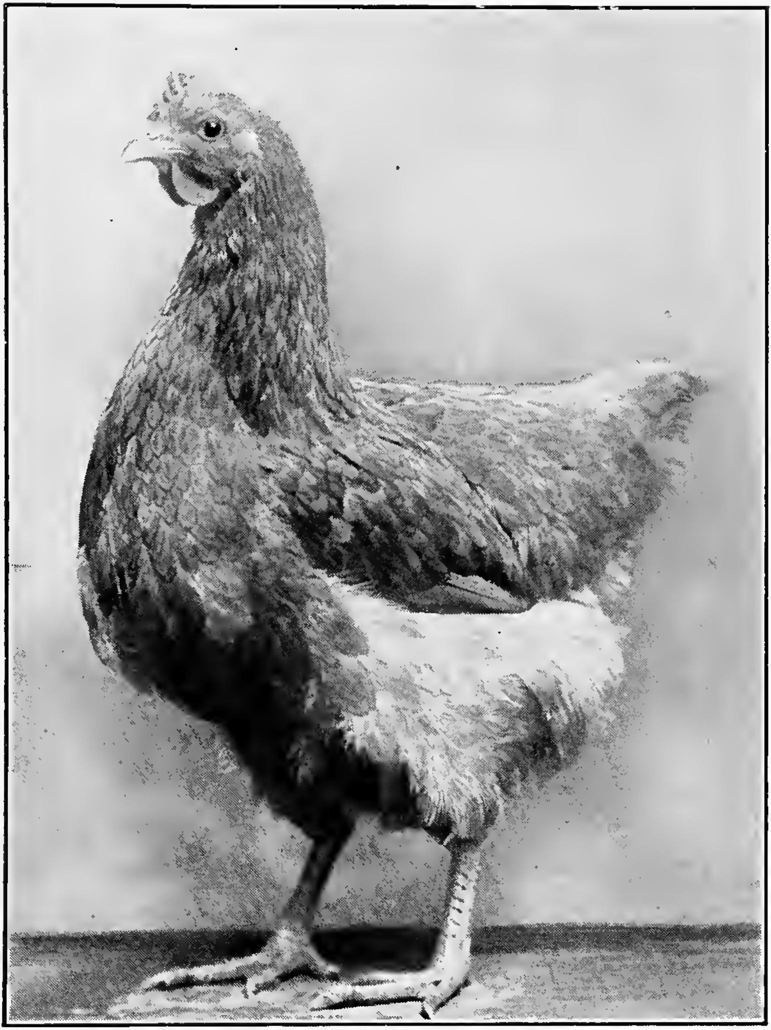
THE CLASSIFICATION OF POULTRY

WHILE it is true that many poultry-keepers realise how important a matter is the careful and judicious selection of a breed, there are many who do not. Some seem to consider a fowl merely as a fowl, regardless of the fact that there is as much difference between the varieties as there is between a Shire horse and a Shetland pony, between a Jersey cow and an Ayrshire. Many of the failures I have come across in poultry keeping are directly attributable to the fact that a wrong, and quite unsuitable, variety had been chosen.

THE SELECTION OF A BRANCH

The poultry industry is divided into a large number of separate branches, and before embarking seriously upon a definite line the poultry-keeper should consider very carefully indeed which branch is likely to yield the best return. There are a great many considerations to be taken into account before a decision is come to, since it must be borne in mind that a large percentage of the failures that one hears of in this business is due directly to the fact that an unsuitable branch has been selected. The local conditions, the climate, and the nature of the soil, the amount of land available for poultry, the nearness to a large town or a station on a main line, and the inclinations of the poultry-keeper himself are all matters requiring careful consideration.

One of the most important branches of industrial poultry keeping is that of egg production, and when the conditions are favourable, it is one which is extremely profitable. The great thing to aim for in this connection



A Buff Plymouth Rock Pullet

A very useful all-round breed

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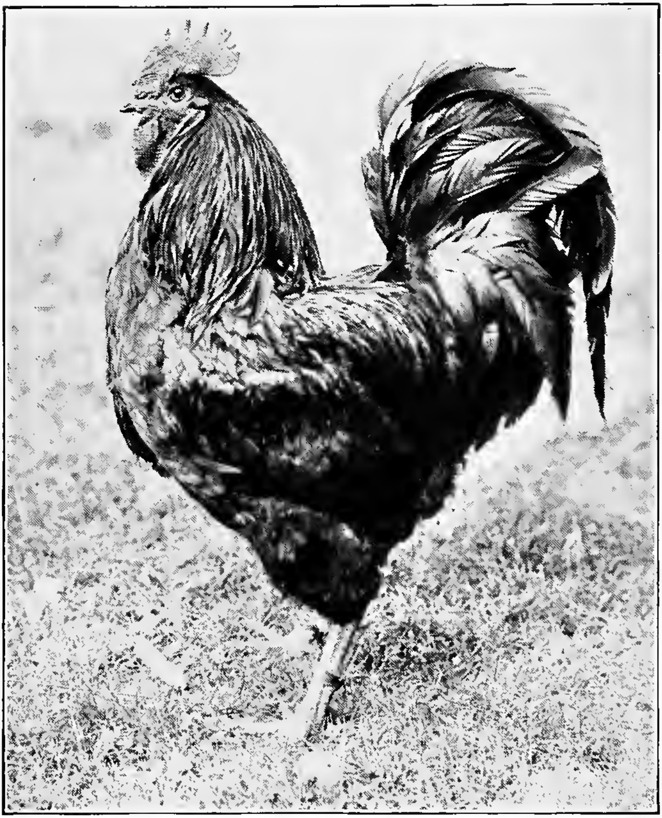

A Black Orpington Cockerel

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is the production of eggs during the winter months, when they are scarce and thus very valuable. It is true that so far as egg production is concerned we have to face strong foreign rivalry, but this is more particularly the case with eggs of second-rate quality. It is possible, however, to buy French eggs in London that are no more than three days old, but the eggs from other countries should not affect at all seriously the home-produced article.

THE TABLE CHICKEN BUSINESS

As a general rule, fattening is a special industry in itself, and at the present moment there are hundreds of people in the counties of Surrey, Sussex, and parts of Kent who are making comfortable livelihoods from this branch alone. Soil and climate have little to do with successful fattening, and thus any part of the country is suitable, provided that it is conveniently situated for disposing of the produce.

The corollary to this branch is producing chickens to dispose of to fatteners, but this would only be attempted in the neighbourhood of a fattening establishment. I know many smallholders and cottagers in Surrey and Sussex who make a considerable sum of money every spring by hatching chickens early in the year, and selling them to the higglers as soon as they are large enough to fatten. An excellent price is obtainable for suitable birds during the spring and early summer, and it is by no means uncommon for poultry keepers to augment their returns to an appreciable extent in this direction. The demand for chickens for fattening is practically unlimited, and there is not the least danger of the supply exceeding the demand for many years to come.

THE SALE OF STOCK BIRDS

In the autumn and early spring an excellent demand exists for breeding stock, and as long as the parents are true to type and of good quality, satisfactory prices are obtainable. The value of the stock birds depends, of course, upon the value of the parents. It is no uncommon thing for the progeny of exhibition birds to realise £10 each, while a few change hands every season for four or five times this amount.

This, however, does not concern us here, for we are dealing with utility birds only. The exhibition of poultry is a business in itself. For ordinary utility stock, however, a satisfactory price can be obtained. The price depends, however, on the pedigree of the birds, but if good stock is bred it leaves a very generous margin for profit, especially as it must be borne in mind that a pedigree bird costs no more to rear than the veriest mongrel that ever existed.

A branch that has received a considerable amount of attention during the last few years is the sale of newly-hatched chickens. At one time an enormous business was done in eggs for hatching purposes, and a considerable number still changes hands every spring, but it is a trade that rarely proves very satisfactory. So many things may happen to the eggs before they are placed beneath the hen or in the incubator, and after all is said and done, when buying eggs one can only buy the possibility of chickens; whereas, on the other hand, in the day-old chicken business one is buying the actual bird.

THE VALUE OF CLASSIFICATION

There are several more or less useful methods of classifying the various breeds of fowls, but the only one that is of real value to the utilitarian is by means of economic characteristics. There are so many distinct breeds and varieties of poultry at the present day that the selection of any particular one is sometimes a matter of extreme difficulty.

It may surprise some to learn that there are upwards of one hundred and fifty breeds of poultry, comprising over three hundred varieties; many of these are purely ornamental birds, and have no value to the poultry-keeper, whose aim is eggs or flesh, or both, but quite a large proportion possesses useful economic qualities. To the uninitiated, therefore, the selection of a variety is sometimes extremely difficult, but by dividing the breeds up into their respective classes the matter is simplified to some extent.

THE IMPORTANCE OF STRAIN

While it is quite possible definitely to label the various breeds of poultry, and to say that such and such a variety excels in certain qualities, there is one matter that must not be disregarded, namely, the question of strain, since this plays an extremely important part in determining a fowl's value.

It is not easy to describe in so many words the exact meaning of the term strain, but a simple illustration will at once make it clear. Let us say, for instance, that two men each decide to keep Buff Orpingtons, but while one is anxious to specialise in egg production, the other is desirous of specialising in table chickens. We may suppose that each breeder buys his original stock from the same man, so that, to all intents and purposes, the birds possess identically the same qualities to commence with.

The man who wishes to go in for egg production breeds and selects his birds with this end in view, using the most prolific layers from among his flock, and buying new male birds of some well-known laying strain to mate with the progeny. The other breeds and selects his birds for their edible qualities—their whiteness of flesh, large breast development, etc.—while he is, to a large extent, indifferent regarding the prolificacy of the hens.

At the end of eight or ten years both men have Buff Orpingtons, but they vary as much in economic qualities as though they were entirely different varieties. In classifying the breeds of poultry, therefore, this point must be borne in mind; all it is possible to do is to consider the breed as a whole, ignoring the special strains that may have been developed.

THE THREE TYPES

Dividing the breeds of poultry by means of their economic characteristics we get three classes, namely (1) the general purpose, (2) the laying or non-sitting, and (3) the table. There still remains another class, the largest of any, namely, the fancy; but the exhibition of poultry is a branch of the industry that does not concern us here, since we are considering the question of poultry keeping from the utility standpoint only. To the fancy class belongs a very large number of breeds, including all the many varieties of Game fowls and Bantams. Fancy fowls are those which are bred and selected for their outward characteristics only—their plumage, shape, comb, wattles, and general appearance. So long as these points are correct, the number of eggs the hens lay or the quality and flavour of their flesh is of small importance. The fancy is a great and valuable class, and there is no doubt whatever that had it not been for the fancy breeds of poultry, and the exertions of fanciers to encourage the breeding of high-class stock, the industry would not to-day be in nearly so flourishing a condition.

THE GENERAL PURPOSE CLASS

The breeds belonging to this class are among the most valuable that we possess, since they combine the two essential qualities of prolificacy and excellent edible qualities. They are all-round fowls, and my experience teaches me that as a general rule they are the most useful varieties to both the smallholder and the large farmer. If a man specialises in egg production, one of the laying or non-sitting breeds would probably suit him better, though this is rather doubtful; while if chickens for market are his aim, one of the table breeds should be chosen.

Those who are not specialists, however, and are anxious to produce eggs and table chickens, as the majority of smallholders are, will find that a breed of the general purpose type suits their purpose better. General purpose hens are prolific, while they are steady sitters and reliable mothers; the chickens are hardy and develop fairly quickly, and the edible qualities are satisfactory, the flesh possessing a good flavour and texture. One of the most valuable features of the breeds of this class is their excellent winter-laying properties. Provided that the chickens are brought out at the right time of year, the pullets may be depended upon to lay well during the winter months, when eggs are so scarce and so exceedingly valuable.

THE LAYING OR NON-SITTING CLASS

The breeds belonging to this class are particularly strong in their egg-producing capabilities, while the quality and texture of their flesh is very second-rate. The hens are remarkably prolific, many laying upwards of two hundred eggs per annum. Unfortunately they are comparatively poor winter layers, producing the bulk of their eggs during the spring and summer. This obviously takes away from their value to some extent, since from March to the end of summer eggs are very plentiful, and hence they realise only a comparatively low price. As the name implies, the breeds of the laying or non-sitting class very rarely evince any desire to sit; occasionally a hen may go broody, but it is unwise to trust her upon valuable eggs, since upon the least provocation she forsakes her nest, and probably destroys all the embryos within the shells. Chickens of this class are very rapid growers, and, as a rule, they are hardy and easy to rear.

THE TABLE BREEDS

The requirements of a good table chicken are whiteness of flesh, a small proportion of bone and offal to flesh, excellent quality meat, large breast development, and rapid growth. These are the points that should be looked for in selecting a table breed; the other economic characteristics that are generally present in a bird of another class are only of second-rate importance in the table varieties. The table breeds are comparatively poor layers, especially so far as winter egg production is concerned; the hens, as a rule, are fairly good sitters and mothers, but they seldom go broody until pretty late in the season. Birds of this type are large in body, with a long keel and large wings, very necessary points in a table chicken, since it enables them to carry a satisfactory proportion of flesh upon the best parts, i.e. the breast and wings.

CHAPTER VI

THE BEST UTILITY BREEDS

In the preceding chapter I endeavoured to show how important a part strain plays in the economic value of a fowl. It is a mistake definitely to state that such and such a breed is the best that there is, for so much depends upon the strain, and the purpose for which the birds have been bred and selected. It often happens that an individual hen of quite a poor breed will produce more eggs during the winter months than a hen belonging to a variety which is famous in this particular respect. There are, however, certain breeds which can rightly be considered the best, and in the following pages I will try and give a few details regarding each variety which may be recommended to the utility poultry-keeper.

THE GENERAL PURPOSE BREEDS

THE ORPINGTON AND WYANDOTTE

The Orpington is without doubt the best all-round fowl there is at the present time. There are several varieties of this breed, the best of which are the Buff and the White.

The Orpington is a large bird with a deep body, and rather short legs. The average weight of an adult cock is from 9 lb. to 10 lb. while a hen weighs about 8 lb. The hens are excellent layers, producing a large proportion of their eggs during the winter. The eggs are of medium size and tinted in colour. The hens are steady sitters and reliable mothers.

The only detail in which the Orpington excels over its chief rival, the Wyandotte, is in the colour of its flesh. That of the Orpington is white, while that of the Wyandotte is yellow, a prejudice against which exists in this country. Apart from this there is really nothing to choose between the two breeds.

The Wyandotte is of American origin, in which country it is immensely popular. It is just as good a winter layer as the Orpington, and apart from the colour of the meat it equals the Orpington in all respects. The best varieties from a utility standpoint, are the White, Buff, and Silver.

THE PLYMOUTH ROCK

A few years ago the Plymouth Rock was one of the most popular varieties in this country, and to-day a large number is to be seen in some parts of the country. The Orpington and Wyandotte have in a great measure, however, usurped its position. Its flesh is yellow and somewhat hard.

The Plymouth Rock is a very useful breed, in spite of the fact that it has been overshadowed rather by the two more recent varieties. The eggs are slightly larger than those of the Orpington or Wyandotte, while the hens are more vigorous. In fact, one of the chief recommendations of this variety is its extreme hardihood.

THE LANGSHAN

The Langshan is the poorest of the four varieties, so far as winter laying is concerned. It is, however, an extremely useful breed, particularly if the "Croad" strain be selected.

It is interesting to note that this breed lays the deepest coloured eggs of any domesticated variety of fowls, and thus the impression is frequently gained that the Langshan egg is the richest there is. This is quite a fallacy, for there is no relation whatever between the colour of the shell and the richness of the contents.

The table properties of this variety are fairly good, while the chickens are hardy and develop, for a heavy breed, tolerably quickly. This is rather an important point, for it means that the surplus cockerels can be disposed of at a better figure than if their edible qualities were poor.

THE FAVEROLLES

When the Faverolles were first introduced, birds of all colours were to be met with, among the most common being Partridge, Salmon, Red, Ermine, Black, and White. Careful selection has been carried out for some years now, with the result that many colours have been eliminated ; and there are now only three recognised varieties. The Salmon is perhaps the one most commonly to be met with. In this case the breast, wing-bar, primary feathers, thighs, under-fluff, and tail are black ; the beard and muffs are black, tinged with white ; the hackles and wing-bows are straw ; and the back and shoulders are a mixture of black, white, and brown. The light variety closely resembles the Brahma, being of a silvery-white colour, with striped hackles, and wing feathers and tail edged with black. In the case of the Black variety it is self-coloured.

The Faverolles is frequently classed as a table fowl, but I think that it belongs rather to the general purpose class. While its table qualities are excellent, the hens are capital layers, and if they are hatched at the right time of the year they produce quite a satisfactory proportion of their eggs during the winter months.

THE RHODE ISLAND RED

Coming from the United States, where it is one of the most popular breeds of utility fowls, the Rhode Island Red is rapidly making progress in this country.

It is hardy and vigorous, an excellent winter layer, and the eggs are good-sized, brown, and of fine flavour. In addition to being first-class utility fowls Rhode Island Reds are extensively bred for exhibition purposes. The male bird is of a rich, brilliant red, varying in shade from deep buff to a rich mahogany, with black tail feathers. The colour is deepest on the back and wings. The female bird should be of an even bay colour, with the tail and ends of the hackle feathers tipped with black.

This breed produces splendid table fowls, and as the colour does not readily show the dirt it fills every requirement of an all-round bird for general purposes.

The following is a brief summary of the chief features of the General Purpose fowls :—

Breed.	Best Varieties.	Standard Weight.		General Characteristics.
		Cock.	Hen.	
		lb.	lb.	
ORPINGTON	Buff and white	10	8	White flesh, skin, and legs; good fatteners; rather prone to broodiness.
WYANDOTTE	White, buff, and silver	8½	7	Of American origin; yellow flesh and legs; otherwise equally good as the Orpington.
PLYMOUTH ROCK	Barred and buff	11	9	Also of American origin; yellow flesh and legs; very big bones; extremely hardy.
LANGSHAN	Black	10	8	The poorest of the general purpose fowls; a few good strains left; lays the deepest coloured egg.
FAVEROLLES	—	8	6—7	A French breed; heavily feathered legs and prominent muffs.
RHODE ISLAND RED	—	9	7	Very popular and exceptionally hardy breed.

THE LAYING OR NON-SITTING BREEDS

THE LEGHORN

Pre-eminent among the laying or non-sitting varieties is the Leghorn. Probably no breed has enjoyed so great or so continuous a popularity. And there is no doubt that this popularity has been thoroughly deserved. During the last few years its place has been taken somewhat by the Orpington and the Wyandotte, but still it is kept very extensively.

There is a very large number of varieties of the Leghorn, the best of which, from a utility standpoint, are the White, Black, Brown, and Buff.

Apart from the Leghorn's wonderful prolificacy, there is another important point in its favour, namely, its extreme hardihood. It is able to thrive well in places where many other of the non-sitting breeds have great difficulty in living.

THE MINORCA

Next to the Leghorn comes the Minorca. There is nothing to choose between these two breeds so far as their egg-laying powers are concerned. If anything, those laid by the Minorca are slightly larger.

The drawback to the Minorca is that some strains are rather delicate, and require favourable surroundings if they are to thrive well. In cases like this the Leghorn—and especially the white variety—should be given the preference.

THE HOUDAN

The Houdan, distinguished by the large crest of feathers it carries on the top of its head, is also a very useful breed. Of the birds belonging to the laying or non-sitting class it possesses far and away the best edible properties. As a matter of fact, it is by no means an indifferent table bird.

THE SCOTCH GREY

The Scotch Grey is a capital breed, and deserves far more popularity than it at present enjoys. It is extremely hardy, and I have never come across a place where it does not thrive satisfactorily. It is not quite so prolific as the Leghorn or the Minorca, but its edible qualities are superior.

THE ANCONA

The Ancona is a very prolific breed, and being hardy it may be kept successfully in places where a more delicate variety would find a difficulty in existing. It is very wild in disposition, and I have always found a good deal of trouble in taming the hens. Its eggs are of a poor quality, containing a large percentage of water.

THE CAMPINE

The Campine, the great egg-producing breed of Belgium, has now become acclimatised to this country, and may be recommended to those who are keeping fowls in runs. It is not so suitable for farm purposes, as it seems unable to stand the rough usage which fowls are generally subjected to on a farm.

The following is a brief summary of the chief features of the Laying or Non-Sitting varieties:—

Breed.	Best Varieties.	Standard Weight.		General Characteristics.
		Cock.	Hen.	
		lb.	lb.	
Leghorn . . .	White, black, buff, and brown	6—8	5—7	The most prolific bird in the world; exceptionally precocious; very hardy; good forager and small eater; yellow legs and flesh.
Minorca . . .	Black . . .	7	6	Lays very large eggs; somewhat delicate, requiring favourable surroundings.
Houdan . . .	—	9	7	Of the non-sitters the best for table purposes.
Scotch Grey . .	—	7—8	5½—6½	Extremely hardy; white flesh and skin.
Ancona . . .	—	6—7	5—6	Hardy and precocious.
Campine . . .	Gold and silver	7	5	Very prolific, hardy, and very small in body.

THE TABLE BREEDS

THE DORKING

The Dorking is our finest table breed, as well as one of the oldest varieties of domesticated poultry. It can boast a longer and more distinguished pedigree than any other breed, with the one exception of the Old English Game. Its flesh properties are of exceptional merit. The body is long and deep, the bones are small, while the quality and flavour of the flesh leave nothing to be desired. There has been a tendency during the last few years to breed for very large size, with the inevitable result that some specimens are rather coarse. This should be guarded against, and the ideal to aim for is a medium-sized bird.

Of the four varieties of the Dorking the Dark and Silver-Grey are the best from a utility standpoint, and are the ones that should be selected for practical purposes.

The hens are fairly good layers of medium-sized eggs, an average bird producing about 110 to 120 eggs in a season. This does not compare very favourably with the non-sitting or the general purpose varieties, but this is only natural.

Unfortunately the Dorking is a rather delicate variety, and it does not thrive well under adverse conditions. Those who are living in a low-lying, damp situation, or where it is very exposed, should select the Sussex in preference, since it is merely courting failure to try to rear Dorking chickens, especially early in the season, under such conditions.

THE SUSSEX

During the last few years the Sussex has proved rather a serious rival to the Dorking, chiefly owing to the fact that it is a hardier breed, and able to thrive well in places where difficulty is experienced in rearing Dorkings. The flesh properties are not quite equal to those of its rival, but at the same time they are extremely good.

The Sussex possesses great length and depth of body, although in these respects the Dorking is slightly superior. The bones are very small, however, and the flesh is of exquisite colour and flavour. The hens are rather better layers than the Dorking, while, as already stated, the chickens are more robust, and able to stand considerably rougher treatment.

THE GAMES

The Old English and the Indian Games possess a remarkable breast development, owing to the fact that for so many generations they have been bred for large wings. In order that a cock might beat his opponent in the ring large and powerful wings were necessary, which has resulted in the huge breast development of the present-day Games.

The chief value of the Games is for crossing purposes, particularly so in the case of the Indian, since its flesh is of a bright yellow colour. Crossed with a white-legged variety, however, it throws splendid progeny, there being no finer table chicken in the world than an Indian Game-Dorking.

Game hens are poor layers, and only indifferent sitters and mothers. The chickens are fairly hardy, and there are few places where they will not thrive well.

The following is a brief summary of the chief features of the Table varieties :—

Breed.	Best Varieties.	Standard Weight.		General Characteristics.
		Cock.	Hen.	
		lb.	lb.	
DORKING . . .	Dark and silver grey	13	9—10	The finest table breed there is ; very deep and broad ; five toes ; not very hardy.
SUSSEX . . .	Speckled, light, brown, and red	9	7	The second finest breed ; very small bones ; hardy, and a rapid grower.
INDIAN GAME . .	—	10	8	Extraordinarily large breast development ; yellow flesh and legs ; very valuable for crossing purposes.

CHAPTER VII

THE LAWS AND PRINCIPLES OF BREEDING

UPON the careful and systematic selection of the breeding stock depends in a very large measure the amount of success achieved. If it is done carelessly, or if it is left until late in the season, one cannot expect to achieve satisfactory results ; if, on the other hand, it is carefully done, one is much more likely to have a balance on the right side at the end of the year.

It is a great mistake to leave the selection of the breeders until late in the season, and the sooner, within reason, that it is done the better. It is only within the last few years that the importance of this matter has been fully realised, but owing to the remarkable progress that has been made in artificial hatching and rearing and in the production of eggs during the winter months, the selection of the stock birds and the mating-up of the pens in the autumn of the year is now an absolute necessity if the poultry are to prove really profitable. Whatever branch of the industry is undertaken, winter eggs are essential ; whether for selling for edible purposes or for producing early table chickens, eggs are wanted, and wanted badly, between October and February.

LIKE PRODUCES LIKE

A law which is extremely important for the poultry-keeper to bear in mind is that like produces like. That is to say, the good points in the parents are likely to be reproduced in the offspring. Equally important, however, is it to bear in mind the fact that the poor features or the poor economic characteristics are also likely to be reproduced in the progeny. Hence it is of the greatest importance that both the male bird and the hens should not possess the same faults, for in this case these faults will probably be greatly intensified in the chickens hatched therefrom. We may take the simple example of a faulty comb. If both the cock and the hen possess a badly-shaped comb, their chickens will in all probability have combs much worse than either of the parents. The same thing applies, of course, to economic qualities—to the laying powers of the pullets, or to the meat properties of the cockerels.

The lesson we may learn from this is simple in the extreme. If a male bird is weak in any particular respect, then the hens he is mated to should be as strong as possible in this feature. This will have the excellent effect of counteracting the poor qualities of the former.

THE MALE BIRD

Very severe indeed should be the selection of the cockerels, since there is only a small demand for them. Only one male bird is required for every six, eight, or perhaps ten pullets; besides which, when one is producing eggs for edible and not for hatching purposes no cock is required at all. Only the more or less perfect specimens should, therefore, be retained.

The cock's influence lies more in the direction of the outward qualities, and in choosing a male bird, therefore, it is necessary to see that he is large and well-developed. There is a difference between large size and merely a large quantity of feather, and this is a point that requires watching. The male bird should be examined carefully to see that he has no defects in body or limbs, since if he possess these faults they are very likely to be reproduced in the offspring, probably in an intensified form.

In selecting a cock to breed layers one should be chosen that is firm and close in body, of a good size, well developed behind, clean and tall on the legs, and active in habits. For breeding table chickens he should be heavy in body, fairly short on the leg, and deep in breast.

An Indian Game Cockerel

This is the most useful breed there is for crossing to produce first-class table chickens

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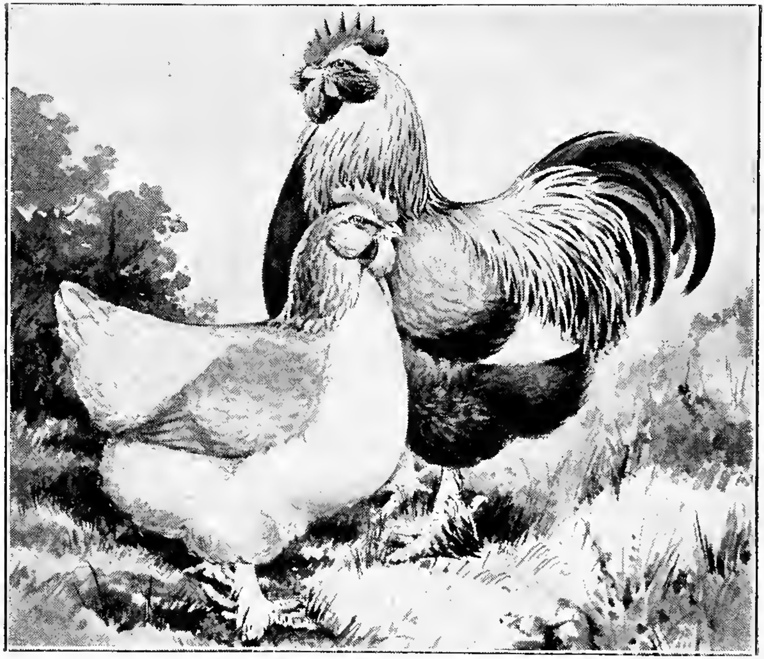

A PAIR OF FAVEROLLES
A valuable breed both for laying and table purposes

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THE HEN'S INFLUENCE

The hen exerts the greater influence upon the internal organs, while she also controls, to a very large extent, constitution, fecundity and habits. In choosing a hen for the breeding pen she should be well-made, of a fair size, and active in habits. A lazy hen is rarely satisfactory.

She should be well developed in the posterior region of the body, for it is here the egg organs are situated. Stamina and good condition are also of extreme importance, for a weak and delicate hen never produces strong and robust chickens.

THE AGE OF BREEDING STOCK

As a general rule, it is a mistake to use very young birds for breeding purposes, for such a mating almost invariably results in unsatisfactory chickens. On the other hand, it is even worse to use very old birds, for the chickens are still more unsatisfactory.

It is during a hen's first and second seasons that she lays most eggs and produces the best chickens. The same is true of the male bird so far as the production of strong and virile stock is concerned. A healthy bird, with a good constitution, may be kept till his third year, but after this he is seldom satisfactory. It is a mistake, too, to mate a yearling cock with yearling hens. If a cockerel—that is, a male bird in his first year—is used, then he should be mated with hens in their second season. On the other hand, a two-year-old cock should be mated to pullets. The use of immature parents is a common fault, and is responsible for much of the delicacy which is so frequently found among chickens of all kinds and all breeds.

IN-BREEDING AND ITS EFFECTS

Sometimes the poultry-keeper has no option but to in-breed. If he is making a new breed, introducing a new colour, or establishing a new feature, sometimes he must use related parents. This should never be done, however, if it can possibly be avoided, for in doing so one is running a grave risk of reducing the value of one's stock. The utility poultry-keeper—the man who is more concerned with the egg-producing or table properties of his birds than with the outward features, such as feathers, comb, or wattles—is very foolish if he in-breeds, for he has not the same excuse as has the fancier.

The results of careless in-breeding are both numerous and serious. They may not become apparent all at once, but sooner or later they are bound to tell. Eggs from related parents are very frequently infertile, representing, perhaps, a considerable loss early in the season ; the chickens are delicate and difficult to rear ; they grow slowly and never attain to the same size or stamina as do the progeny of unrelated stock ; the hens when they reach a laying age are generally unprolific, and the male birds often refuse to perform their duties in a satisfactory manner.

A few years ago, when the number of reliable utility poultry-keepers was comparatively small, there was some excuse for in-breeding, but to-day this excuse no longer exists.

GOOD HEALTH ESSENTIAL

Only birds that are in perfect health should be allowed a place in the breeding pen, because if the parents are unhealthy or possess any grave physical defects, these are likely to be transmitted to the offspring. The birds should, without exception, have the usual signs of health. They should be active, with bright red combs and wattles, while their plumage should be of a brilliant lustre. The appetite is a reliable guide to health, for if it is normal it may generally be accepted that the bird is suffering from no serious complaint ; if, on the other hand, the fowl refuses its food it may be taken for granted that there is something wrong somewhere.

THE FORMATION OF THE PEN

Infertile eggs, weak germs, and delicate chickens are often the result of too large a breeding-pen. Too small a pen has sometimes a similar effect, but this is comparatively unusual. It is by no means easy to lay down a hard and fast rule in this respect, for the exact number of hens that may be mated to a male varies so greatly in accordance with circumstances. Some breeds are more vigorous than others, and thus the cocks can attend to more hens than in the case of a lethargic and lazy breed. This especially applies to the laying or non-sitting varieties. When fowls are enjoying a free range, the breeding-pen can be larger than when they are confined in a run. Moreover, later in the season the cocks can attend to a larger number of hens than they can during the early months of the year.

As a guide, but only as a guide and not as a hard and fast rule, the following figures may be accepted. Early in the breeding season, that is during November and December, a cock of a non-sitting type enjoying liberty can look after the requirements of ten hens, gradually increasing this number as the season advances until by spring fourteen and even sixteen is none too many. This number would be too great in the case of a heavy variety, such as the Orpington or the Wyandotte. With these breeds six hens is quite sufficient early in the season, increasing to a dozen towards the spring.

LINING A FOWL

In order to determine a hen's economic qualities, and so know what her value is for breeding purposes, she should be closely examined, for there are several external signs which help one in arriving at a decision. A large, red comb, for instance, generally denotes a good layer. Again, a short-legged hen with a long body is usually more prolific than one with long legs and a very dumpy body. But there is a much better way of arriving at a hen's value. This is by means of the method known as lining. One of the inexorable laws of Nature is that the use of any organ or part of the body tends to its increase, the disuse to its decrease. This is a law of which we see evidences every day, and which applies to all living things. The more a man uses any part of his body the larger and stronger it becomes; one who is constantly doing manual labour increases the size and strength of his limbs. On the other hand, the less a man uses any part of his body the weaker and smaller it becomes, and if this is continued for several generations the limbs or organs become appreciably less.

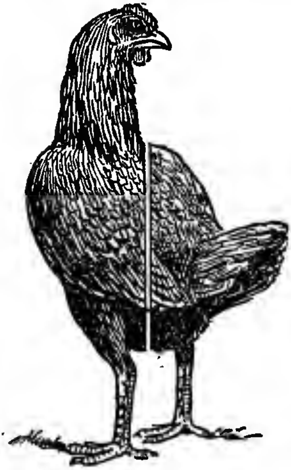

FIG. I.—THE TABLE TYPE

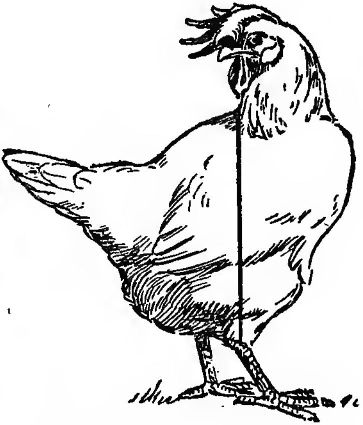

FIG. 2.—THE LAYING TYPE

It is by means of this law that the method termed "lining" denotes the utility qualities of a fowl; it is because it is based on this invariable law that it always proves correct. An imaginary line is drawn through the centre of the body, from the neck just where the hackle feathers rest, to the legs, as is shown in the illustrations reproduced on this and the following page. In Fig. I an Indian Game hen is represented with the imaginary line drawn through the body. We see that the greater portion is in front of the line, while the egg organs are comparatively small. Thus we know at once that a bird of this shape is most valuable for edible purposes.

In the second illustration a White Leghorn has been chosen, and here we observe that the posterior region of the body, where the egg organs are situated, is well developed, while the breast is small. It is evident, therefore, that a bird of this description is an excellent layer, but possesses poor table qualities.

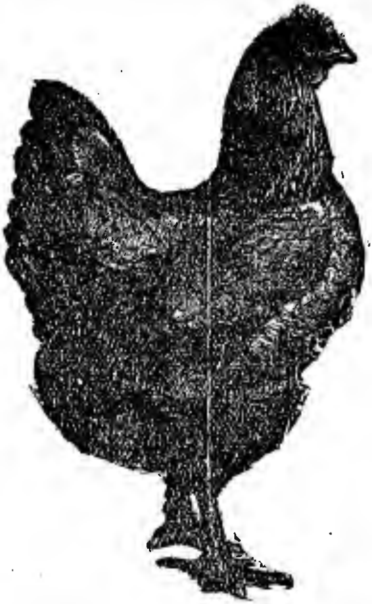

FIG. 3.—THE TYPE WHICH COMBINES GOOD EGG-LAYING AND TABLE QUALITIES

In Fig. 3 a Langshan is seen, and in this case the body is about evenly balanced. Such a bird is a good all-round fowl. It is a better layer than the table breeds, but it is poorer in table properties, while it is inferior as a layer to the non-sitters, but its edible qualities are superior.

PURE VERSUS CROSS-BRED FOWLS

The fancier—that is, the man who regards the outward characteristics only, the feather markings, the shape of comb and wattles, or the exact shade of the legs—has no use for anything save pure-bred fowls. A cross does not appeal to him in the least, for it is quite useless for exhibition purposes. If the fancier possess a bird which is not absolutely true to type it is only occupying space that could be put to a much better use, while it is costing money for feeding and housing, from which he can expect to get no return.

The chief advantage of relying upon pure-bred fowls is that the breeder knows more or less exactly what his chickens will be like. However carefully a man may cross-mate his birds, he never knows what the progeny will turn out to be so far as their outward features are concerned. Where eggs for hatching, day-old chickens, or stock birds are the main business it is necessary to stick to pure-bred fowls, because for this branch purity is the very basis of the business. Moreover, it must be remembered in this connection that pure-bred fowls cost no more to house or to feed than do mongrels.

ADVANTAGES OF CROSSING

The chief value of crossing, in my opinion, is that it gives greatly increased vigour and stamina to the offspring. There is always a danger that finely bred birds—and this applies equally to all kinds of stock—may become delicate, a state of affairs against which the poultry-keeper must fight very strenuously.

Cross-bred fowls are always much hardier than pure varieties. The mixing of the blood of two distinct breeds has this very excellent effect. Smallholders who live amid surroundings that are rather trying to fowls are advised to use crosses rather than pure breeds. This is, of course, provided that it is the utility and not the fancy side of the subject in which they are interested.

Another striking advantage of crossing is that it is possible to minimise the defects of an otherwise good variety. Say, for instance, one has some very good hens, which are capital layers, but which possess hard or yellow flesh, rendering them unsuitable for table purposes. If these hens are mated to a cockerel which is particularly strong in its edible qualities, the progeny will not be quite such prolific layers as the mothers, but their flesh properties will be much better; while, on the other hand, they will be better layers than the stock from which the cockerel came, although they may not possess quite such good meat qualities. This is really another way of saying that it is possible by crossing to combine the good qualities of two varieties. It requires to be done very carefully, however, for if there is any carelessness in the mating considerably more harm than good may accrue.

TRAP-NESTS AND THEIR VALUE

There are some people who would have us believe that no poultry-keeper can achieve really successful results unless he trap-nests all his hens. It is impossible, they say, to build up a strain of really first-class layers without their aid. But is this so? I, for one, do not think so.

It is quite true that when trap-nests were first introduced everything appeared to be in their favour. It is necessary, however, to reconsider methods adopted in connection with poultry keeping as with all other pursuits. It is not possible to determine the true value of a system until it has been subjected to a long test by a large number of experimenters. It is frequently found that what seems helpful and useful at first proves in the long run to be lacking in the results anticipated.

I have no hesitation at all in asserting that trap-nesting has not proved nearly so useful or so authentic in practice as was at first thought possible. Trap-nesting has, however, done good; but perhaps more in the direction of eliminating poor layers than in finding out the best and most prolific hens A number of poultry-keepers who have tried these nests for a number of years have no good word for them; but this is not a proper attitude to adopt. Trap-nests are necessary in order to make selections as a basis for breeding, but by themselves they give insufficient evidence to enable one to achieve good results.

It comes to this, that trap-nests, in conjunction with a knowledge of the laws of breeding, record particulars that are extremely valuable. It has been proved conclusively that the characteristic of high fecundity is transmitted through the male side, and many are the instances in which the use of a cockerel from a heavy-laying hen, mated with good females, has given excellent results.

While trap-nesting possesses certain faults, and is not itself a sure method of building up a good laying strain, it yet possesses several distinct advantages, and I recommend its limited use. The results that accrue must be read in the light of experience and according to the general laws of breeding. For eliminating the poor layers, discerning the early layers, and for securing cockerels from the heaviest layers, this system is admirable.

THREE SIMPLE TRAP-NESTS

A good trap-nest can be made out of a cube sugar box, four light hinges, a little strip of tin 6 inches long and a yard of thirteen gauge iron wire. These are the particulars of its construction:—

A is the drop door which is hinged to the top of the opening as shown.

B is the stepping-on board which is hinged to the inside of the bottom front of the box.

C is the simple lever arrangement that both holds and releases the drop door A.

D is a piece of tin to act as catch and lock when the door A falls.

E is a piece of wire driven into door A for end of catch C to slip into.

F is a short bit of wire bent as shown in the sketch, and held in position by a ring staple screwed into the top of the box; the other end of the wire marked F is put through a hole made in the top of the box, and is attached to the stepping-on board.

When the hen enters the nest and steps on the board B she pulls down the lever C, and releases the hinged door A, which falls and is locked by the catch marked D.

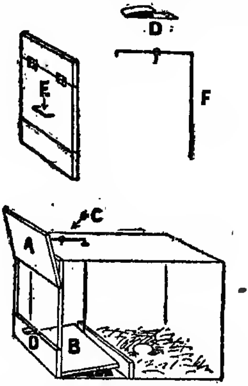

FIG. 4.—A TRAP-NEST MADE FROM A CUBE SUGAR-BOX.

Another very simple form of trap-nest is made as follows:—

Bend a rod of iron wire to the shape of a U, the width between the arms being about 3 inches. The length of

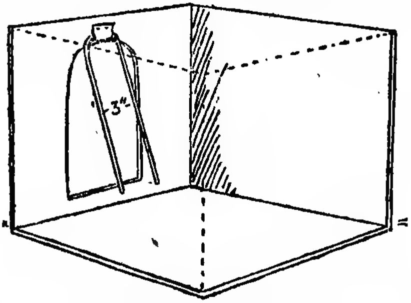

FIG. 5.—A VERY SIMPLE, BUT QUITE EFFICIENT TYPE OF TRAP-NEST

the U should be slightly longer than the height of the entrance to the nest. With a loop of tin fasten the iron U with the ends down, to the top of the entrance, allowing the two ends to fall inside, so that they cannot swing outwards. The hen going in to lay, pushes up the bars, which then fall and prevent her leaving the nest until she is released.

The following trap-nest, though rather more elaborate than the foregoing, is still simple to make and simple to work :—

The fowl enters the forecourt of the nest, and passing to the nest proper steps on to the board L. This at once pulls down the thick wire rod R. Now the trap-door of the nest is connected to the rod R by means of a string S, and a small ring P, which is slipped just over the top of the rod. Thus, when the platform L is pressed down the rod is withdrawn from the ring, and so the trap-door is released.

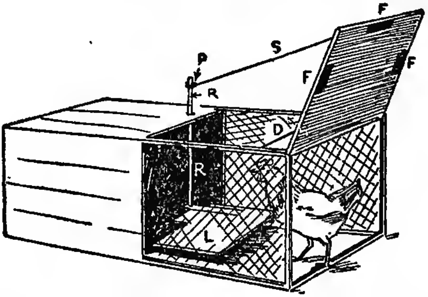

FIG. 6.—A MORE ELABORATE FORM OF TRAP-NEST.

A small block of wood D prevents the trap-door from falling backwards, and pads of felt F silence it as it shuts. Without these pads of felt the bang as the door fell might startle the hen.

Fowls, though shy at first in entering a trap-nest, soon get used to it, especially if encouraged with a few grains of wheat or oats thrown into the forecourt.

CHAPTER VIII

THE PRINCIPLES OF HOUSING

A GOOD house is half the battle in the successful management of poultry. A poor house almost invariably spells dissatisfaction—slow growth, ill-health, and a low yield of eggs. While nothing elaborate is required, the house should be substantially built, it should have a suitable floor, it should be well-lighted and well-ventilated, the inside fittings should be suitable, and it should be kept scrupulously clean.

THE BEST MATERIALS

When a poultry-house has to be made, wood is undoubtedly the most suitable material to employ in its construction. Bricks certainly maintain a more even temperature, but they are too expensive. Besides this a brick shed becomes the landlord's property while a wooden house does not, so long as it is not built into the ground.

Many otherwise excellent houses fail in that they are made of too thin boarding, with the inevitable result that they are too cold during the winter and too hot during the summer. In the case of a permanent house the boarding should be an inch, or at least ⅞ inch in thickness; a portable house must be light, otherwise its chief purpose is defeated, and thus the boards may be rather thinner, but they should not be less than ¾ inch. Not only should timber of sufficient stoutness be used, but there should be no crevices between the boards, while sound material should be employed which is not easily affected by rain or sun.

Corrugated iron makes an excellent roof, but it must not be used alone, since it is a very rapid conductor of heat and cold; there must be a thin layer of matchboarding beneath. An almost ideal roof is made of a layer of matching ⅜ inch thick, with felt nailed on the upper side; then a space of 2 inches, and above that corrugated iron. The 2-inch space between the iron and felt is essential, since it allows a current of air to pass along, which has the effect of maintaining an equable temperature.

THE POULTRY-HOUSE FLOOR

The ground itself makes the best form of floor, and except in very wet places it should always be used in preference to wood, cement, or bricks. Cement is too cold, while bricks, being absorbent, retain the liquid portion of the droppings, ultimately preventing the house from smelling quite sweet and pure. The earth inside the house should be dug out to a depth of 5 or 6 inches, and filled with large stones, broken bricks, or very coarse gravel, upon the top placing a layer of fine binding gravel or earth. Well beaten down, this forms an excellent floor. A raised floor to a poultry-house, while possessing certain advantages and affording a scratching-place to the birds beneath, has the drawback of making the interior colder during the winter and warmer during the summer, heat and cold being atmospheric and not of the earth.

Overcrowding the poultry-house must be avoided and, roughly speaking, 2 square feet of floor space per bird should be allowed, i.e. a house measuring 6 feet by 8 feet provides suitable accommodation for two dozen adults. However good the system of ventilation it is wellnigh impossible to keep the air within an overcrowded house sweet and pure.

LIGHT AND VENTILATION

In a well-lighted poultry-house fowls thrive much better than they do in one which is dark. For one thing' a dark place is very unlikely to be quite clean, light being one of the greatest purifiers we possess.

In most poultry-houses there is a window, but as a rule it is much too small. Its size should vary, of course, to some extent in accordance with the size of the house itself, but generally speaking it should not be less than 2 feet square. It should, moreover, be made to open and shut, so that during warm weather it may remain open all day, and night too, wire-netting being placed over the opening to keep the birds confined within. Without an abundant supply of fresh air fowls cannot remain healthy. They soon lose their appetites, their feathers become dull, and there is every indication of loss of

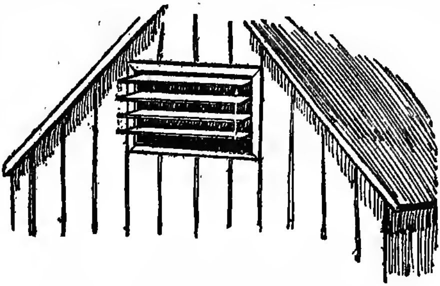

FIG. 7.—A GOOD WAY OF VENTILATING A POULTRY-HOUSE.

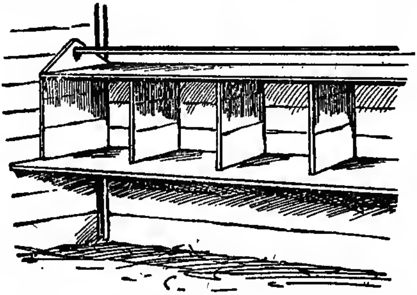

FIG. 8.—IF YOU RUN YOUR PERCHES ABOVE THE NEST-BOXES THE ROOF OF THE LATTER WILL ACT AS A DROPPINGS BOARD.

vigour. The ventilating arrangements should be well above the heads of the birds, for a draught is worse than too little air.

Some holes should be pierced in the highest part of the ends, their number and size depending on the measurement of the house. One of the best plans is to pierce a dozen or so holes, at the back of which a small sliding shutter should be fixed, so that the amount of air admitted can be regulated to a nicety. Louvre boards are really more suitable than holes, since they only admit the air in an upward direction, thus effectively preventing a draught reaching the birds (Fig. 7).

THE INSIDE FITTINGS

When insufficient or unsuitable nest-boxes are provided the hens are very prone to lay their eggs upon the floor of the poultry-house, or even in the run, thereby encouraging the annoying and costly habit of egg-eating. The most convenient size for a nest-box is 15 inches square, and 15 or 18 inches high; it should be raised a foot or so from the ground, resting upon a shelf. When the nests are upon the floor the eggs are less easy to collect, the hens are likely to be disturbed, while there may be danger from rats or other vermin. The top and sides should be solid, but there need be no back if they are stood against the wall of the house. On no account should there be a bottom, for this renders cleaning so very difficult. The front, of course, should be quite open. The top of the nest-box should slope steeply towards the front, or else it should be enclosed with wire-netting, in order to prevent the birds roosting thereupon, as they are very fond of doing. If the nests are placed in the darkest part of the house the hens are unlikely to be disturbed while laying.

The best form of perch is a fir pole, about 2 inches in diameter, or, failing this, 2-inch square quartering, rounded at the corners. For young birds a shelf, 5 or 6 inches wide, is the most suitable, for a narrow perch invariably damages the breastbone, reducing the birds' marketable value very considerably. The perches should all be upon the same level, and they should be raised a foot or 15 inches above the ground. There is no advantage in having high perches, while there are several disadvantages. A considerable amount of liver disease is directly caused by having the perches too near the roof, since the cold strikes down directly on to the birds' backs. Low perches entirely obviate this danger. The roosts should be fixed sufficiently wide apart to allow plenty of room for the birds; as a rule, they should not be nearer than about 2 feet.

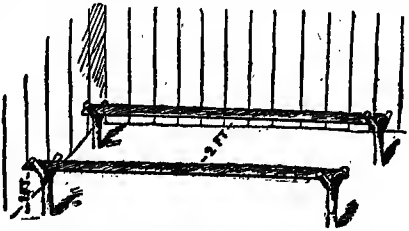

FIG. 9.—AN EXCELLENT METHOD OF FIXING THE PERCHES.

THE BEST LITTER

There is no better covering for the floor of a poultry-house than peat moss litter. It is cheap, it remains sweet for a long time, and it is an absorbent and a deodorizer. If the floor is covered to a depth of 5 or 6 inches, and the litter is raked over every morning and forked once a week, it will not require renewing for about eight or ten months, provided that the house is not crowded. When finished with in the house it forms a suitable manure, but it requires very careful using, since peat moss is practically indestructible, and if applied to the land in large quantities, it soon makes the soil boggy.

For the scratching-shed there is nothing better than straw, chaff, or barley screenings, and particularly are they suitable when the plan of scattering the afternoon grain is adopted. Dried leaves or bracken are likewise suitable, while they have the advantage of being exceedingly cheap.

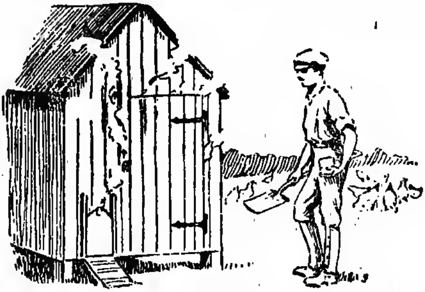

FIG. 10.—THOROUGHLY TO DISINFECT A POULTRY-HOUSE THE OPENINGS SHOULD BE CLOSED, AND SOME SULPHUR BURNT WITHIN.

CLEANLINESS ESSENTIAL

The interior of a poultry-house should be kept scrupulously clean, for if the inmates are troubled with insect pests they are neither so prolific nor so healthy.

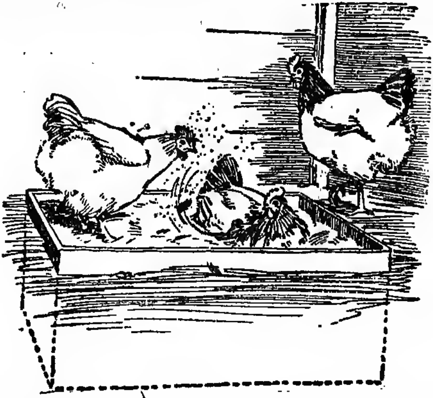

FIG. 11.—ALL FOWLS ENJOY A "DIP" IN A BOX OF DRY SOIL OR ROAD GRIT. IT KEEPS THEM FREE FROM VERMIN.

A RHODE ISLAND RED COCKEREL
Few varieties can equal this as a winter layer

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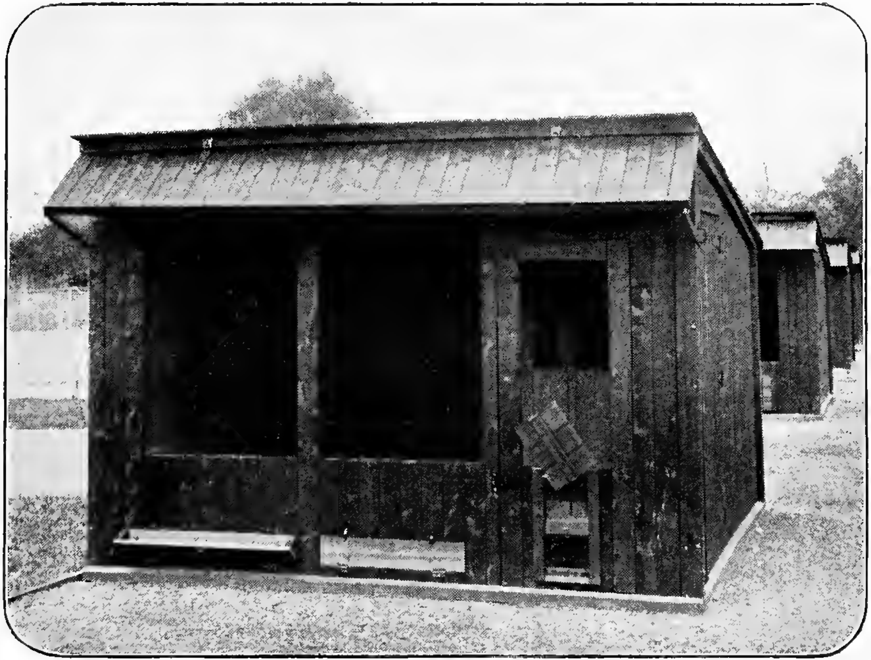

AN OPEN-FRONTED SCRATCHING SHED

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The walls and roof should be whitewashed at least three times a year, and once every week they should be swept. Instead of using lime and water only it is a good plan to prepare a rather more elaborate mixture, and the following I have found to be an extremely good one. To four gallons of lime and water there should be added half a pound of soft soap and a pint of paraffin oil, the former of which causes the liquid to adhere firmly to the walls, and so allows them to be swept, while the paraffin oil kills all vermin. In whitewashing a house particular attention should be devoted to the cracks and crevices, for it is in such places that vermin mostly congregate, coming out at night while the birds are roosting. The ends of the perches should be dipped into paraffin oil every few weeks, and the sockets in which they fit should be washed out with the same liquid.

CHAPTER IX

POULTRY-HOUSE PLANS

So long as the general principles of housing, indicated at length in the preceding chapter, are followed it is quite immaterial what exact form the house takes. Its construction and shape do not matter, so long as it affords full protection to the birds from wind, rain, cold and heat. On this and the following pages are given full particulars of a range of scratching-sheds, a cheap scratching-shed, a portable house, and a backyard house and run or intensive poultry-house. These are given as types, and not exact forms to be slavishly followed.

A RANGE OF SCRATCHING-SHEDS

Of the many methods of housing which have been introduced from time to time there is none better for the man whose space is limited than that known as the scratching-shed. It is so called because the accommodation for each pen consists of a roosting compartment, a scratching-shed, a small gravel run, and the entire or partial use of a large grass plot.

The accompanying illustration explains the general plan on which the system is based. There are, however, a few details which need explaining. In the illustration a laying-house as well as a roosting compartment is shown. This is not necessary, but it is advantageous. Instead of using trap-nests an arrangement can be made whereby the hens can enter the laying-house, but cannot escape until liberated by the attendant. If no record of the hens' laying is wanted, then the roosting compartment would occupy the entire length at the back; its measurements would therefore be 9 feet by 4 feet, and not 6 feet by 4 feet, as shown in the drawing. Doors lead from the scratching-shed into both the roosting compartment and laying-house, while a trap-door, for the use of the hens, is fixed between the two compartments. Perches run along the back of the house, facing the scratching-shed.

The scratching-shed itself measures 9 feet by 6 feet,

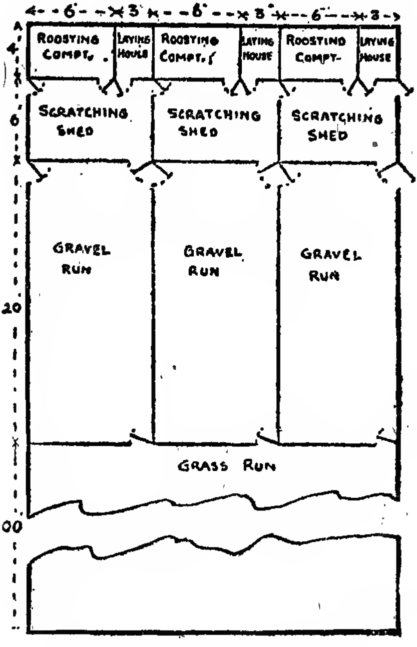


FIG. 12.—PLAN OF AN UP-TO-DATE SCRATCHING-SHED SYSTEM.

and is under the same roof as the roosting compartment, making altogether a covered-in space of 9 feet by 10 feet. A door leads from one scratching-shed to another, in order to simplify the work of the attendant. The partition between the roosting compartment and scratching-shed is boarded halfway up, the topmost half consisting of wire-netting. Save for a few inches at the top and a few inches at the bottom, the entire front of the scratching-shed is wire-netted.

THE RUNS

Immediately in front of the scratching-shed there is a gravel run, measuring 20 feet by 9 feet, the width of the house. This is an important part of the system ; in fact, without this gravel run there would be grave danger of tainted soil. Good binding gravel should be used, and it should be well beaten down, since it requires sweeping once a week in order to remove the droppings.

The fowls are always fed in this run, never in the grass plot beyond. When the weather is bad, feeding should take place within the scratching-shed, but whenever possible, the soft food, at all events, should be given in the open air.

Beyond the gravel run there is a large grass plot, measuring about 100 feet by the width of the three houses, 27 feet. Each pen of fowls has the use of this grass plot for the third of a day, the remainder of the time being confined in the gravel run. In practice this is found to answer excellently. Since first thing in the morning the earth is freshest, it is wise to liberate the pens at different periods of the day.

The shape of the grass run is important. A square plot, even though it contained as many square feet, would not have quite the same effect. The reason for this is that the moment the fowls observe the soil near the houses to be getting at all exhausted, and they can tell sooner than we can, they merely move further down, thus always having fresh space to exercise themselves. In a square plot they are constantly running about all over, and no part is unused.

A CHEAP SCRATCHING-SHED

A very inexpensive scratching-shed can be made from calico stretched upon a wooden framework. It is necessary to have two layers of calico with an air-space of

2 inches between them. This is a point of paramount importance. The air space between the two layers of calico maintains an equable temperature within the house. A house built after this plan is warm in winter and cool in summer.

Convenient measurements for a house of this description are 8 feet long, 6 feet wide, and 6 feet high in front, sloping down to 4 feet 6 inches at the back. A house of these measurements provides capital accommodation for a dozen fowls. If you are only keeping half a dozen hens still make it of these measurements, since it always allows you to increase your stock at any time with no added expense for house room.

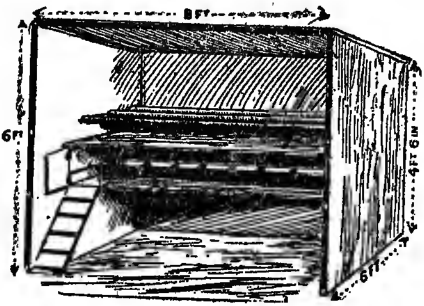


FIG. 13.—THE INTERIOR OF THE CALICO POULTRY-HOUSE DESCRIBED ON THIS PAGE. A DOUBLE THICKNESS OF CALICO IS USED, WITH AN AIR SPACE BETWEEN.

The framework must, of course, be made of wood, and for a house of this size it must be fairly stout, since there is no match-boarding to make up for any deficiencies in the framing. The framework on the ground as well as the uprights at each corner should be made of 2-inch-square quartering. The cross-pieces at the ends and the front and the back of the roof should also be made of similar wood. The rest of the framework can be made of 2-inch by 1-inch quartering. I have found it an excellent plan to strengthen the corners by using 6-inch iron angles. Eight of these are sufficient.

We can now estimate the quantities of wood which are required to build the house, and also the approximate cost. These will be:—

	£	s.	d.
78 feet of 2-inch by 2-inch		9	2
Three 8-feet lengths of 2-inch by 2-inch (perches)		3	0
90 feet of 2-inch by 1-inch		6	5
60 feet of boarding 6 inches wide and ⅝-inch thick		9	8
Total . .	£1	8	3

In the above estimate sufficient timber is allowed to fix two rails in each end and the back, and the necessary 2-inch by 1-inch required for the door, etc. The match-boarding is sufficient for the dropping-board and nest-boxes, as well as the pieces along the front. The cost of wire-netting, nails, screws, and hinges, should not exceed 4s. 9d.

Unbleached calico can be bought at 7½d. a square yard. For the whole house, including the roof, 34 square yards are required. This is allowing, of course, for double thickness and plenty of overlapping. The cost of covering the house with a double thickness of calico, therefore, taking these figures as a basis, works out at about 23s. 2d., bringing the total cost of the scratching-shed, including all the necessary fittings, to:—

	£	s.	d.
Framework	1	8	3
Nails, etc.		4	9
Calico	1	3	2
Total . .	£2	16	2

The actual construction of the house is so very simple that it requires little explanation. The calico has, of course, to be fastened on very carefully, otherwise it will tear away. Large-headed nails must be used for the purpose, or else narrow strips of old oilcloth fastened on with nails above the calico. Strips of wood are perhaps best of all; but these add to the expense.

Then the calico should wrap well over the framework wood, to make it absolutely secure. It is not sufficient merely to tack it on without this fold-over. The outside calico should be thoroughly well tarred—at least two coats being given to begin with, and then a coating twice a year. The inside calico should be whitewashed.

A PORTABLE POULTRY-HOUSE

The portable poultry-house illustrated on page 73 is built in six sections. The sections comprise front, fitted with door; open wired front with sliding shutter; two ends, one with outlet for fowls with ladder attached, the other fitted with flap for nest-boxes; back nailed to lengths of 2 in. by 2 in.; floor, supported on framework of 2 in. by 2 in. timber, and resting on stout wooden bearers; roof, nailed to three rails of 2 in. by 1 in. The house is supported on strong cast-iron wheels, 13 in. diameter, fitted with axles bolted to stout wooden supports.

Floor.—8 ft. 10½ in. by 4 ft. 4½ in., framed up with 2 in. by 2 in. stuff, joined at corners and end, as shown at *b* and *a*. Covered with ¾ in. tongued and grooved boarding, flush with outside of frame.

Front.—This is fitted with door, 4 ft. 6 in. by 2 ft. 3 in., and sliding shutter, 5 ft. 2 in. by 1 ft. 10 in. Runners for shutter of 2 in. by 1 in. and 1 in. by ¾ in. stuff. Opening 5 ft. by 2 ft. 3 in., covered with wire. Two 8 ft. 10½ in. lengths of 2 in. by 2 in. for top and bottom rails, and one 6 ft. length for perch supports required, as well as four 5 ft. lengths and ten 2 ft. 6 in. lengths for matching, etc.

Ends.—These are nailed to lengths of 2 in. by 1 in. placed edgeways. Top rail to be 2 in. down, bottom rail 4¾ in. up. Opening for nest-boxes, 10 in. deep and 3 ft. 6 in. long, 5¾ in. up. Flap, opening outwards and hinged at lower edge, made of 10 in. lengths, nailed to 2 in. by 1 in. battens. Bevelled rail over top to prevent water entering nests. Outlet for fowls opposite end, 10 in. by 12 in., with round top; ladder, 10 in. by 1 ft. 6 in., hinged to short batten, and buttoned up flat when not in use.

Back.—9 ft. by 4 ft. 3 in., nailed to rails of 2 in. by 2 in. One 8 ft. 10½ in. rail of 2 in. by 1 in. for perch supports; latter, shown at *S*, made of 3 in. by 1 in. (odd lengths being utilised).

Roof.—9 ft. 8 in. by 5 ft. 10 in., nailed to three 9 ft. 8 in. lengths of 2 in. by 1 in., and covered with felt placed lengthways. Roof bolted on front and back.

Wheels.—13 in. by 2 in., with strong wrought-iron axles, bolted to wooden bearers of 4 in. by 3 in. stuff. Hooks, for trace, are made of ladder hooks, with end bent over and screwed to bearer.

Perches of 2 in. by 2 in. stuff, rounded on top and fitted in sockets. Dropping boards fitted beneath.

Nest-boxes.—Fitted in at door end and nailed to lengths of 2 in. by 1 in., covered with sloping board to prevent fowls roosting on top.

Cost of Material.—The figures given are average prices. It is impossible to give exact prices for they vary so, according to the locality. Although not universal they will act as a guide in the majority of cases.

	£	s.	d.
2½ squares ¾ in. matchboarding . .	3	8	3
80 feet run of 2 in. by 2 in. deal .		9	3
85 feet run of 2 in. by 1 in. deal . .		6	4
11 feet run of 4½ in. by 3½ in. deal . .		11	0
Wire netting, felt		7	4
Nails, staples, screws, hinges, nuts, bolts, and washers		6	11
Wheels and fittings, ladder hooks, locks, etc.		17	4
Paint for outside and limewash for interior		7	0
	£6	13	5

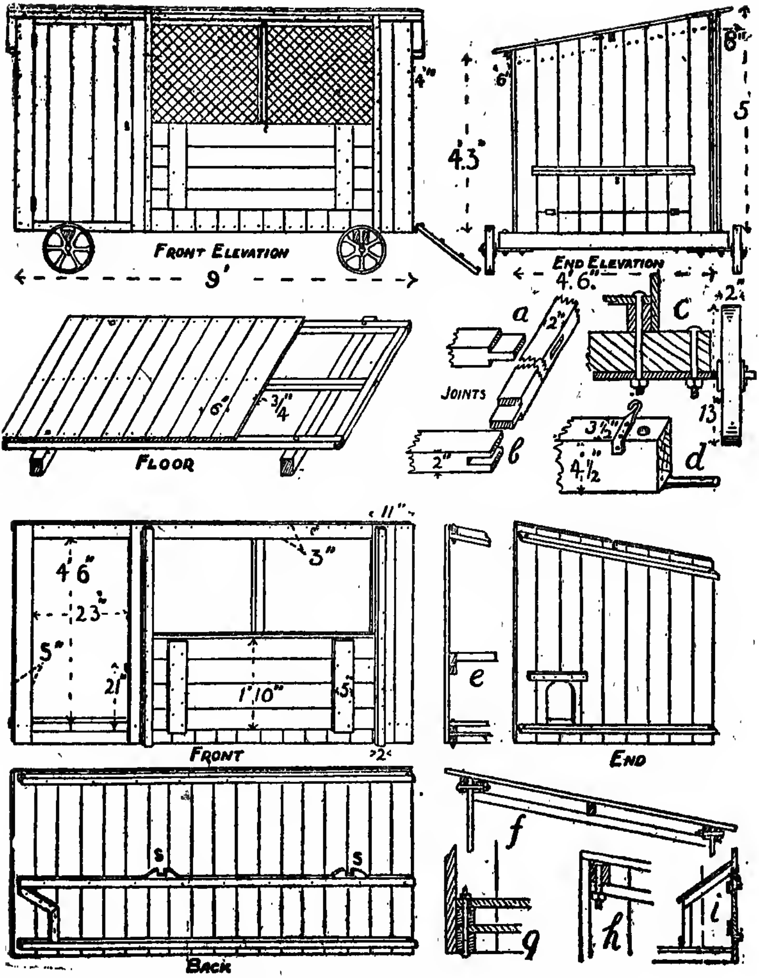


FIG. 14.—PLANS OF A PORTABLE POULTRY-HOUSE.

A BACKYARD HOUSE AND RUN

(See pages 76 and 77.)

The house and run shown in front and end elevations in Figs. 1 and 2, and in plan in Fig. 3, is designed to utilise all the ground space for the run, and has provision for the roosting-house on an upper floor. Both ends may be easily opened out for cleaning. The front of the roosting-house also opens out full width and height, and the nest-boxes are easily removable.

The framing is easily made, the only joints being the simple lapped halving. This is one of the easiest joints to make, and no one, not even the veriest amateur carpenter, should experience any difficulty. It is a serviceable joint and quite sufficient for the purpose.

To make the construction quite clear, a perspective sketch of the framework is given in Fig. 4. First make the two end frames, as shown in Fig. 5, from 2 in. by 2 in. quartering, halving the corner and top pieces to form a good joint, as shown in detail in Fig. 6. Next take two 14 ft. lengths of 5 in. by ¾ in. matching, and two similar lengths of 2 in. by 1¼ in. quartering, and nail the two former in front, as shown at *a*, and the two latter attach to the back, with the half-lapped joint as shown at *b* and *c* and in Fig. 7. The four outside rafters shown at *d* should be laid on the ground and marked off to the correct slope, a rise of 12 inches, and then the ends fitted in 1 in. by ½ in. slots cut in the 5 ft. 6 in. by 7 in. by 1½ in. ridge board, as shown in Fig. 8. The other ends are nailed to the outside of the end frames.

The front frame is composed of two uprights, *e* and *f*, each 5 ft. 6 in. by 2 in., with three rails, *g*, *h*, *l*, of the same material halved in at the heights shown. This frame is now placed in position, and nailed to bottom boards and rafters.

Similar uprights, *k* and *l*, halved as shown in Fig. 9, to the long rails should be fitted at the back. Half-way between the ridge board and the end frame fit in a length of 6 in. by 1 in. boarding, as shown at *m* and *n*. This practically completes the framing.

The back should be boarded with 5 in. by ¾ in. matching, nailed against long rails and to rafters. The top should be cut off flush with the slope of latter. The ends are fitted with two doors, made of 2 in. by 1¼ in. quartering, framed up, as shown in Fig. 10, and boarded up about 18 inches with 5 in. by ¾ in. matching. The upper part is covered in with wire. The doors are hinged with 2 in. butts, and provided with bolts and handles, etc.

The roosting-house is boarded each side with 5 in. by ¾ in. matching, the boards being placed horizontally and nailed to inside of frame within ¾ inch of front. The floor is made of 6 in. by 1 in. boards, nailed to front and back rails, front end of boards being ¾ inch from outside edge.

The opening is made for fowls on right-hand side, about the centre. A board is provided and hinged to floor to form ladder. Two doors are provided for front as shown, 5 in. by ¾ in. matching being cut as indicated, nailed to 5 ft. 5 in. lengths of 2 in. by 1¼ in. quartering, and placed ¾ inch away from the lower edge for top door, and ¾ inch away from upper edge for bottom door, other edges being flush.

Both doors should be hinged with cross garnet hinges as shown, and top door provided with chain and hook. Wooden buttons should be fitted each end to close flaps when necessary.

The roof consists of 7 in. weather-boards, with capping nailed on to rafters. If preferred, six 8 ft. sheets of corrugated iron may be screwed on instead.

The front of the house consists of wire netting fixed on from the inside all over the open front, in between rails *h* and *i*, and at the top covering the space indicated at *i*. The nest-boxes are made as shown in Fig. 11, with three 5 ft. 6 in. lengths of quartering, with upright sides of ¾ in. matching.

The perch is made of 2 in. by 2 in. quartering, fitted into sockets nailed to the sides. The upper edges should be rounded in order not to injure the birds' feet.

The inside of the house should be whitewashed, and the outside painted with oil paint or tar.

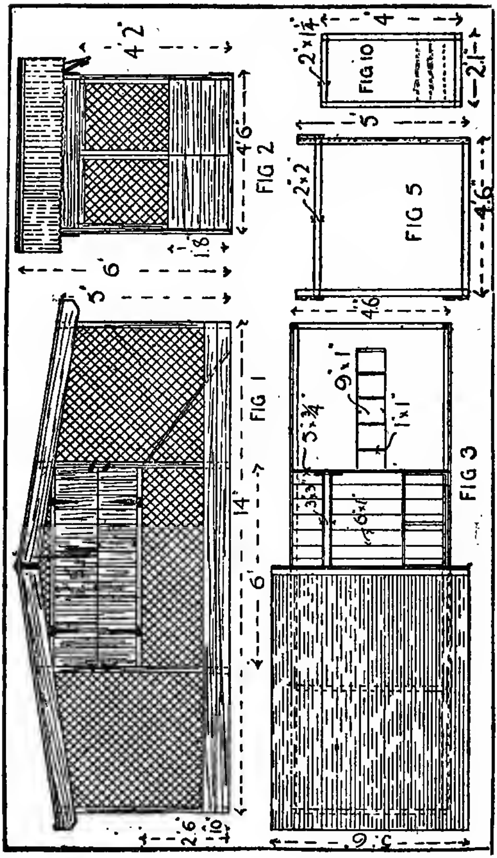
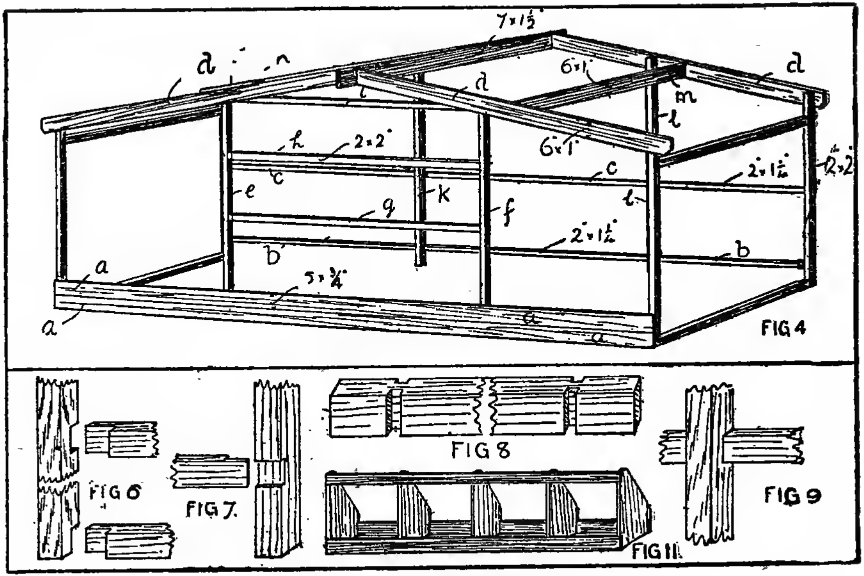


FIG 1
FIG 2
FIG 3
FIG 5
FIG 10
4' 2"
4' 6"
1' 8"
6'
5'
14'
6'
2' 6
10"
5' 6
4'
2' 1"
2"×1¼"
5'
2"×2"
4' 6"
4' 6
9"×1"
5"×¾"
1"×1"
3"×2"
6"×1"



PLANS OF A BACKYARD HOUSE AND RUN.

(For detailed description see pages 74 and 75.)

CHAPTER X

NATURAL AND ARTIFICIAL INCUBATION

INCUBATORS have now passed far beyond the experimental stage. They are now no longer the toys that they were a few years ago, and they have become an essential feature on every modern poultry-farm and smallholding. At the same time, hatching by means of hens is still as useful as ever it was, and the system possesses many distinct advantages. My advice is to combine the two methods—use sitting hens when they are available; when they are not available resort to the employment of an incubator.

One of the chief advantages of natural hatching is that there is no outlay. An incubator costs money and the hen doesn't. She is already upon the place, and if she is not used when she is broody she won't be producing any eggs. Besides this, the rest of sitting does her good, and she is all the more likely to lay well afterwards.

The great advantage of an incubator, on the other hand, is that it is always ready to work, and hatches as well in the depth of winter as it does in the height of summer. Winter hatching is essential if you are going to make money out of poultry, and this is just the very time when broody hens are conspicuous by their absence. Even if an occasional hen is obtained during the winter it is unwise to trust her upon valuable eggs, because upon the slightest provocation she may forsake and ruin them.

When one is working on a large scale the question of labour is one of vital importance, and this is another direction in which the artificial method of hatching scores over the natural. An incubator holding two hundred eggs does the work of about sixteen hens, and it can be attended to in far less time than the hens. As a matter of fact, when operations are conducted on an extensive scale incubators are a necessity, if only from the point of view of labour.

THE QUESTION OF HEALTH

There is still a prejudice in the minds of many against artificial hatching, and they imagine that chickens hatched artificially are neither so strong nor so healthy as are those brought out under a hen. This is quite a mistaken idea, and it has been proved over and over again that when birds are attended to properly and provided with good brooders and suitable foods they are equally hardy and thrive equally well as those hatched in the natural manner. Everything depends upon the manner in which the birds are treated. If they are neglected, failure is bound to ensue; but this applies equally to the natural method.

Another statement that requires to be contradicted is that incubators do not hatch as large a percentage of fertile eggs as do hens. If the machine is carefully attended to by an experienced person, the hatching results are just as successful.

WHERE TO SIT THE HEN

Quietude is essential if the hen is to sit well. If she is in a place where she is likely to be disturbed or where she can see the other fowls it is improbable that she will bring off a good batch of chickens. Always, when possible, sit the hen at night. She should be placed on a few dummy eggs for a couple of days first, in order that she may become accustomed to her surroundings; then when she shows signs of sitting quietly the dummies should be taken away and the real eggs placed beneath her. A large hen can cover fifteen or even seventeen eggs, but a small one may be unable to manage more than eleven. It is well to err on the side of the smaller number, otherwise several of the eggs may fail to hatch.

A separate nest-box should be provided for each hen. There is no objection to having several fixed together, but each compartment should be quite separate. An old orange-box, or other similar box or crate, can be made into a very good set of nests. A convenient size for a nest-box is 15 inches square and 15 or 16 inches high. The top, sides, and front should be solid; so should the back, unless the box is placed with its back to the wall, when a back can be dispensed with. There should be no fixed bottom to the nest-box, for in this case it is so difficult to keep it thoroughly clean.

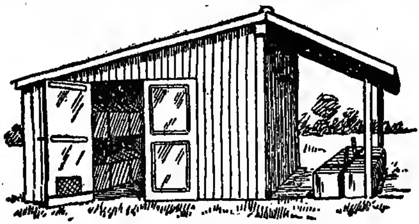


FIG. 15.—A SPECIAL BROODY-HEN HOUSE, WHERE THE BIRDS CAN BRING OFF THEIR CHICKS IN PEACE AND COMFORT. ANY EXISTING SHED CAN BE ADAPTED.

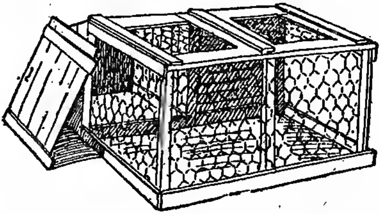
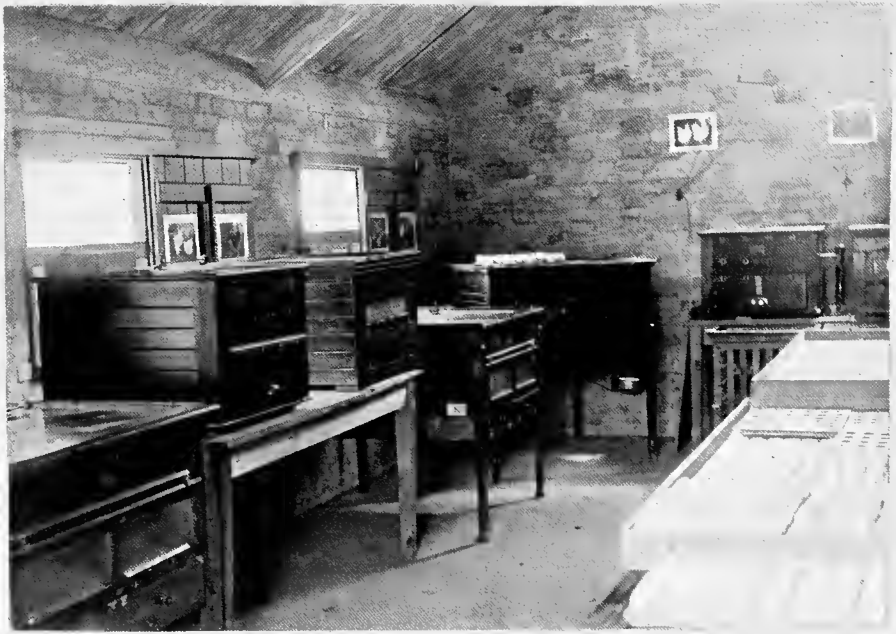
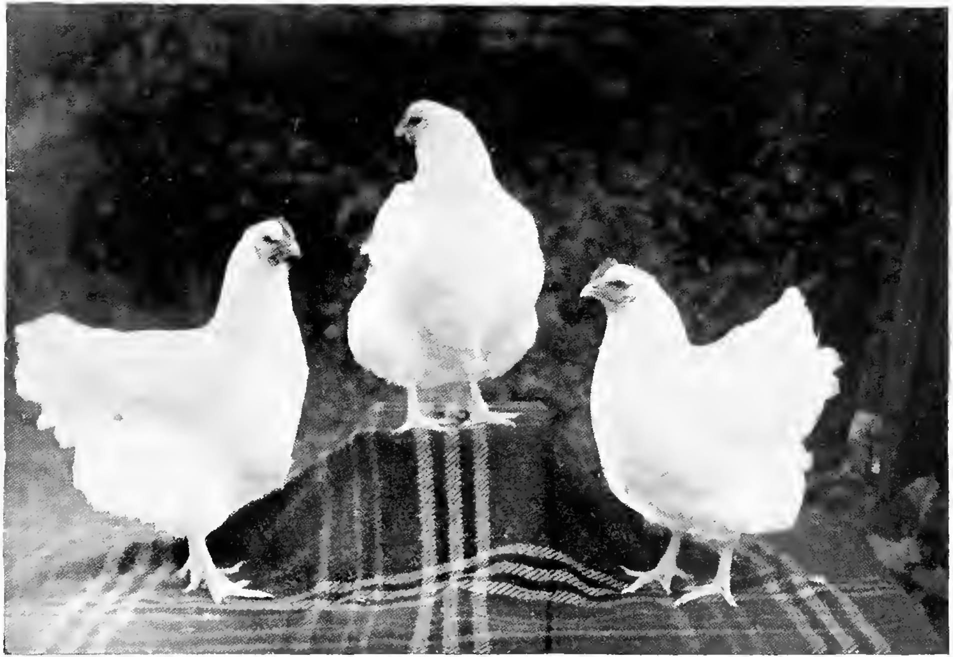


FIG. 16.—THIS IS A USEFUL FORM OF OPEN-AIR SITTING-BOX. IT PROVIDES ACCOMMODATION FOR TWO FOWLS, EACH OF WHICH IS RELEASED INTO THE RUN AT FEEDING TIME.



A WELL-ARRANGED INCUBATOR HOUSE
Both the hot-air and hot-water Incubators are shown in use

To face page 80



A Trio of White Orpingtons

To face page 81

The best plan is to stand it on the earth. This makes the best floor. If there is danger from rats wire-netting can be nailed across the bottom, but, if possible, it is better without, as wire-netting renders proper cleaning a very difficult matter.

If a hen is comfortable she is much more likely to sit well than if she is uncomfortable. A good nest is a great inducement towards this end. To make a nest there should first of all be placed in the bottom of the nest-box a few inches of fine earth, hollowed out in the centre in the form of a saucer. This is in order to prevent any eggs rolling into the corners and becoming chilled. On the earth some straw—oat straw is preferable to either wheat or barley—should be placed, after having been well rubbed in the hands. Hay is not recommended. On the straw the eggs should be laid.

MOISTURE ESSENTIAL

If the weather is warm and the earth dry it is advisable to provide the eggs with rather more moisture than they are able to obtain from the soil. Some people are in the habit of damping the eggs, but a better method than this, I think, is to water the earth around the nest-box two or three times a week; the moisture quickly soaks through to the earth within the box and is then drawn, by the heat of the hen's body, to the eggs themselves.

On the nineteenth day it is a good plan to dip the eggs into water heated to about 103 degrees, in order to soften the inner and outer membranes, so making it easier for the chicks to pierce the shell.

It is necessary to cool the eggs once every day throughout the three weeks of incubation. If the eggs are not cooled as large a percentage of chickens will probably make their appearance, but they will not be nearly so robust as they would have been had the eggs been regularly cooled. One can't lay down a hard and fast rule and say that the eggs must be cooled just so long. This is a matter which must, to a large extent, be left to the poultry-keeper. It all depends on the outside temperature. Half an hour or even longer would do the eggs no harm on a warm day, whereas a third of this period might mean death to the embryo during five or six degrees of frost.

When the weather is normal during the spring months the eggs may be cooled for fifteen minutes during the first week of incubation; during the second week the time may be increased to twenty minutes; while during the last week, provided that the weather is still favourable, the time of exposure may be, with safety, extended to twenty-five or even thirty minutes. The object of cooling eggs is to stimulate and strengthen the chickens, which is so necessary for their full development.

TESTING FOR FERTILITY

On the seventh day of incubation the eggs should be tested to determine how many are fertile. By this means you may be able to economise the hen's labour very greatly. Say, for instance, four hens are set upon the same day, which is always a wise plan to adopt, and when the eggs are tested on the seventh day it is found that a few under each hen are infertile, the remaining fertile ones can be concentrated under three hens, thus freeing the fourth, which may be reset.

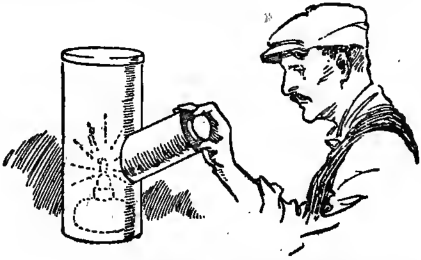


FIG. 17.—AN EGG-TESTER, MADE OUT OF TWO TINS AND A CANDLE.

Another advantage of testing is that, at the end of seven days, the eggs are quite suitable for cooking purposes. Still another advantage is that if the clear eggs are allowed to remain under the hen for three weeks they are liable to give off a bad smell towards the end,

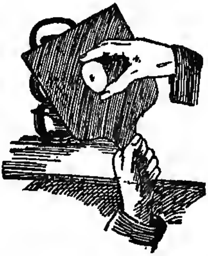


FIG. 18.—A BICYCLE LAMP AND A PIECE OF CARDBOARD CUT TO THE SHAPE SHOWN COMBINE TO MAKE A MOST USEFUL EGG TESTER.

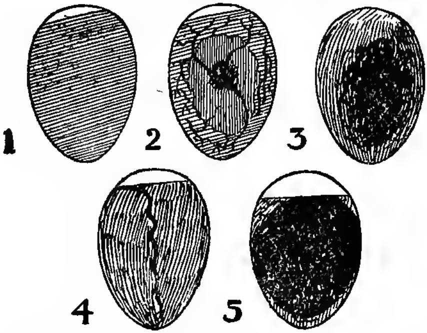


FIG. 19.—ALL EGGS THAT HAVE BEEN SET SHOULD BE TESTED ON THE SEVENTH DAY. THEY MAY BE INFERTILE (1), ADDLED (3), OR HAVE A "BROKEN YOLK" (4). THEY ARE ONLY WORTH KEEPING WHEN FERTILE AND QUITE SOUND (2). THE FIFTH SKETCH SHOWS HOW A FERTILE EGG LOOKS ON THE FIFTEENTH DAY OF INCUBATION.

possibly having an injurious effect upon the ones containing chickens.

To test an egg for fertility is quite a simple matter. It should be held between the first finger and thumb of each hand before a good light in a dark room, care being taken to exclude all light save what passes through the egg. If the egg be fertile a spider-like form is seen towards the broad end, very fine blood-vessels radiating from a dark spot. If the egg be clear it is infertile.

FEEDING THE SITTING HEN

Hard grain only should be supplied to sitting hens, and not soft food. Being fed once only in the twenty-four hours a slowly digesting food is required, in order to sustain the birds for the remainder of the day. The best grains are wheat and maize.

Grit and pure drinking water should be provided, and the hen should be allowed to have as much of these as she wants during the time the eggs are being cooled. Green food is not needed during the time the hen is sitting.

A dust-bath in which a little insect-powder has been sprinkled should be within reach of the hen when liberated from her nest. This is the most effective way of keeping parasites in check.

Perfect cleanliness must be observed, since insect pests are encouraged more by neglect in this direction than by anything else. The presence of vermin adds considerably to the discomfort of the hen, and is most destructive to the newly hatched chickens.

The hen should be disturbed as little as possible while the chickens are hatching. She should be lifted off the nest for a few moments three or four times a day, and the empty eggshells removed, for if this is not done some of the empty eggshells may become fixed on to the full eggs, meaning that the chickens will have two shells to pierce instead of one and probably causing their death.

THE CHOICE OF AN INCUBATOR

It is merely a waste both of time and money to attempt hatching eggs in an unreliable and badly constructed machine. But this is a matter which is easily overcome, since there are upon the market to-day half a dozen thoroughly reliable incubators, machines that are scientifically constructed, and yet simple and reliable to manipulate. The price of a high-grade machine is by no means prohibitive; its cost is repaid by two or three successful hatches. But it is a great mistake to buy too cheap a machine, for in this case indifferent material and workmanship must be expected. It cannot be otherwise. One of the recognised makes should be purchased, for they have been tried and proved.

There are two distinct types of incubators on the market at the present moment—the hot-water and the hot-air. In the case of a hot-water machine there is a large tank extending over the whole of the top of the incubator. This is kept filled with water, and the flue from the lamp passing through heats the water, and so heats the egg-drawer. This kind of machine possesses an advantage over its rival when the room in which the incubators are worked varies greatly in temperature. Obviously a large body of water takes longer to rise or fall in temperature than a corresponding amount of air. There are several structural differences in the two types of machine, but these need not concern the poultry-keeper. Good results are what he is after, combined with ease of working. In both these respects there is nothing to choose between the hot-air and the hot-water types of machines.

WHERE TO WORK THE INCUBATOR

The best place of all in which to work an incubator is in a cool, dry cellar. There is always an even temperature below the level of the ground, for heat and cold are atmospheric. In the United States, where I have visited a large number of poultry plants, the incubator rooms are nearly always underground ; but we do not experience the same degrees of heat and cold in this country, and thus, unless a cellar happens to be available, it is unnecessary to excavate one specially for the purpose. Theoretically, the outside temperature should have nothing to do with the inside heat of the incubator. In practice, however, we find that it has.

Failing a cellar, the best place to stand the machine is in a room into which the direct rays of the sun do not enter, and where there is little traffic. The machine, moreover, must stand perfectly steady, as, if it is subjected to shocks it is quite likely that some of the chickens when hatched will be deformed.

The hot-air incubator is nearly always made with four legs, and thus, provided that the floor is a sound one, there is no difficulty about the matter. Hot-water machines, on the other hand, are rarely made with legs, and they have to stand upon a table or shelf. It is a good plan to stand them upon the crate in which they arrive. This forms a quite steady and solid basis.

THE RIGHT TEMPERATURE

A great variation in the temperature of the egg-drawer has a bad effect upon the hatching results. Not only do fewer chickens make their appearance, but those that do make a successful exit are liable to be delicate. An incubator is automatically regulated, and thus once the apparatus is properly adjusted, there is little difficulty in maintaining a regular temperature. Of course, at all times something is liable to go wrong, and it is necessary carefully to watch the regulator.

In a tank machine the best temperature to work at is 104 degrees. In the hot-air machine a temperature of 103 degrees gives the best results.

Twice daily the eggs within an incubator should be cooled. A common mistake is that the eggs are not cooled sufficiently long, with the result that the chickens are not as strong or as hardy as they might be when hatched. During the winter months, when the weather is cold, ten minutes is quite long enough, whereas during the summer twenty-five and even thirty minutes is not too long.

While the eggs are cooling they should be turned—not end over end, but sideways. It simplifies matters to mark the eggs with an X on one side and an O on the other; this ensures that none are missed. Unless the eggs are regularly turned the partly developed chicken is liable to stick to the shell. It is important to see that the hands are quite clean while turning the eggs.

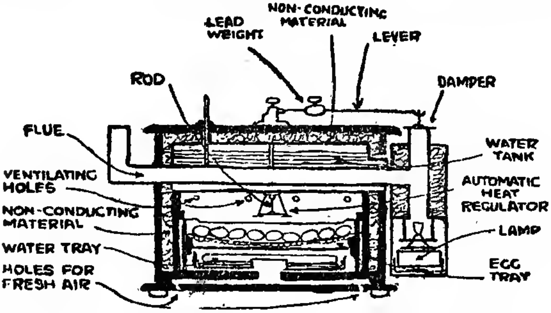


FIG. 20.—INTERIOR VIEW OF A MODERN INCUBATOR.

MOISTURE AND CLEANLINESS

While eggs are being incubated they must be provided with sufficient moisture. If there is a lack of moisture the inner and outer membranes—the two thin skins immediately within the shell—become thick and tough, and the chicken cannot pierce them. When there is a water-tray provided this should always be kept filled.

It is a good plan to dip the eggs into water heated to about 100 degrees on the nineteenth day of incubation. This serves the useful purpose of softening the inner and outer membranes, thus making the exit of the chicken more easy.

The lamp must be kept scrupulously clean; if it becomes dirty it smells, and this is liable to injure the eggs within the egg-drawer. The wick should be trimmed carefully, and the edges rounded. Be sure that the lamp is filled every day.

Finally, while the chickens are hatching don't interfere with them more than can be helped. Once the egg is pipped no more cooling is necessary. The drawer should be opened every few hours, and the empty egg-shells removed, as if they are allowed to remain they are liable to become fixed upon a full egg, thus making the exit of the chicken almost impossible.

CHAPTER XI

NATURAL AND ARTIFICIAL REARING

WHILE chickens are actually beneath a hen they should be disturbed as little as possible. As a matter of fact, unless the hatching is very prolonged, neither the hen nor the youngsters should be looked at more than is necessary. Twice a day it is a good plan very gently to raise the hen and remove any empty egg-shells there may be. To disturb the hen much is always likely to lead to trouble, especially if she be of a nervous disposition, besides which it is very liable to give the chickens a chill, which at this age is a serious matter.

When all the eggs which are going to hatch are empty, and the chickens are dry—this generally takes about twenty-four hours—the hen should be carefully lifted off the nest and given a good meal. It will probably be at least a day, perhaps a day and a half, since she has had anything to eat, and she cannot be expected to look after her chicks well if she is hungry. Having been fed for so long on hard grain she will appreciate a feed of mash, together with fresh water and some green food. Do not let her remain away from the nest for more than half an hour at the most.

There is no hurry about giving the chicks their first feed. They are all the better if they are not encouraged to eat during the first thirty-six hours of their lives. The reason for this is that what remains of the yolk is absorbed into the body of the chicken immediately before hatching, and this contains sufficient nutriment to sustain the chicken for a day and a half, or even two days.

When the hen has satisfied her appetite she should be carried to the coop, where she should remain for about half an hour, in order that she may become accustomed to her surroundings. The chickens should then be carried to her in a felt-lined box or basket, and placed beneath her one by one, care being taken that none is left out in the cold.

COOPS AND COOPING

It does not matter at all what the shape or construction of the coop is, provided that it is dry, well ventilated, roomy, and rat-proof. It must likewise afford ample protection from the wind and rain, and it must be sufficiently stoutly built to enable the hen to keep herself and her brood warm.

The roof, back, and sides of the coop should be solid, but the front should be made of bars of wood, placed about a couple of inches apart, which enables the chickens to run in and out freely, but keeps the hen a prisoner within. Over the front there should be fixed a shutter, which can be closed at night. The best way to fix it is to hinge it at the tops, so that when it is raised it provides protection from wind, sun, and driving rain.

The most convenient size for a single coop I have always found is 21 to 24 inches square, 24 inches high in front, sloping down towards the back to about 18 inches, so that the rain may run off immediately. When the coop can be placed beneath a cart-shed or in a large, airy barn there is no need for a floor, even in the depth of winter. If, however, the ground is wet and the coop has to stand out in the open, then a floor becomes necessary. The best plan is to have one that is movable, so that it can be put in or taken out at will.

My reason for advising you to dispense with a floor where possible is that I have always found chickens kept on bare boards somewhat susceptible to leg weakness. If you must have a floor, therefore, strew it with straw, chaff, or some other sort of litter in which the chicks can scratch about.

THE DOUBLE COOP

I am a great believer in the double form of coop, particularly for use early in the season, when bad weather must always be expected. The double coop consists of the ordinary coop with a covered-in run attached, both the inner and outer compartments being beneath the same roof.

Between the inner compartment and the run there should be a division made of wooden bars, placed 2 inches apart, so that while the hen is kept within the chickens can at all times go into the covered-in run. Convenient measurements for a double coop are 4 ft. by 1 ft. 9 in. This means that the inner chamber is 21 in. square, and the covered-in run 21 in. wide and 2 ft. 3 in. long.

To rear chickens successfully it is necessary to provide them with pure and fresh ground. Tainted soil is an almost certain forerunner of disease, and must be avoided at all costs. For this reason the coop should be moved twice or thrice a week to a fresh place, for chickens quickly taint the ground immediately around the coop. I would go further than this, and strongly recommend those who are rearing chickens not to use the same plot of ground two consecutive years if it possibly can be avoided.

SELECTING A BROODER

The choice of a good brooder is of the utmost importance. However painstaking or skilful the poultry-keeper may be, it is practically impossible to rear chickens successfully in an unreliable machine. It is the height of false economy to purchase one that possesses any grave defects, even though it may cost but a few shillings. A machine of this description is likely to prove very costly in the long run. When selecting a brooder there are many points that should be carefully noted, particularly the apparently unimportant things. Far more often than not it is just these that cause failure and disappointment.

The brooder itself should be well and substantially made; it should be of sound material and good workmanship. The walls should be at least an inch in thickness, while the inner or sleeping compartment should have two thicknesses of timber, with a small air-space between.

A brooder is constantly being moved from one place to another, and it thus requires to be very strong, and to possess plenty of stout framework. The roof should be covered with felt or some such material, as wood alone is liable to warp and to allow the damp to enter. The floor of the sleeping compartment should not rest upon the ground, but should be raised a few inches in order to ensure dryness.

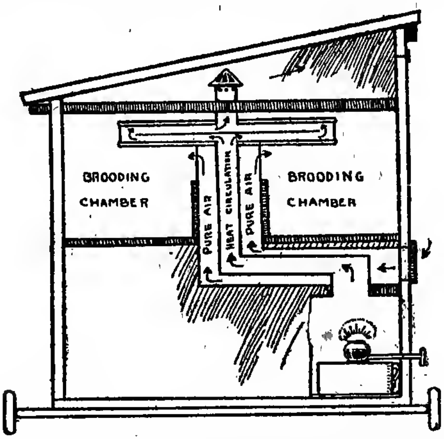


FIG. 21.—THIS DIAGRAM ILLUSTRATES A GOOD ARRANGEMENT OF THE BROODER LAMP. ANY FUMES ESCAPE THROUGH THE HOLES AT THE TOP OF THE FLUE, THUS KEEPING THE AIR IN THE BROODING CHAMBER ALWAYS PURE.

THE BEST TEMPERATURE

It is a fatal mistake to coddle chickens, as so many are in the habit of doing. There is always a temptation, I know, to coddle young chickens, under the impression that this is bound to be good for them. Never was there a greater error. Coddling must be avoided, for it invariably results in the enfeeblement of the constitution. The other extreme, that of supplying too little heat, must also be avoided, for it is equally injurious. There is a happy mean to strive after, which is easy to attain with a reliable machine.

During the first few days of the chickens' life the heat should be maintained at about 90 degrees Fahr., this temperature being registered after the birds have been within for some time, since they naturally raise the heat a good deal. Eighty-five degrees is sufficient during the second week, and 80 degrees during the third. The lowering of the temperature should be done gradually, since a sudden drop is extremely liable to check growth.

When the chickens are from seven to ten weeks old the heat may be dispensed with. To state a definite age is impossible, since so much depends upon the vitality and breed of the chickens and the state of the weather. If the birds are of a somewhat delicate variety and the weather is severe it may be necessary to keep the lamp going till the birds are ten and even twelve weeks old. If, on the other hand, the chickens are of a hardy breed and the weather is mild it is quite safe to dispense with artificial heat when the birds are seven weeks old and even younger.

PURE AIR AND CLEANLINESS

Chickens reared in a brooder must not be overcrowded. Carelessness in this respect is responsible for a great amount of trouble. When they are overcrowded the air becomes foul, and this reduces vitality and retards development. Besides, deaths are very likely to occur owing to the birds all crowding into the corners and suffocating one another. The makers of the brooders are often to blame in the latter respect, because they advertise their machines as being capable of accommodating too many chickens. It must be remembered, too, that while a brooder may comfortably hold a hundred chickens when they are three or four days old it may be altogether too cramped for them when they are a fortnight old.

Not only is pure air an essential factor towards health, but so is absolute cleanliness. Theoretically, artificially hatched and reared chickens should be quite free from vermin until such a time as they are allowed to mix with the general flock. But in practice it is found that this is rarely the case, owing to the fact that sufficient care is not taken as regards the cleanliness of the brooder.

After each batch of chicks, the brooder, particularly the inner compartment, should be scrubbed with boiling water and then whitewashed, special attention being paid to the corners and to any cracks or crevices there may be, for it is in such places that insects congregate. With the whitewash there should be mixed a little soft soap and paraffin oil, the former to cause the mixture to adhere to the walls, the latter to destroy all insects.

FREQUENT REMOVAL

At all costs must tainted soil be avoided. There is no single thing which has so injurious an effect upon the health and growth of chickens as foul soil. If disease be not actually engendered growth and development are seriously retarded. If possible, the same plot of ground should not be employed for rearing two consecutive years. Every other day the brooder should be moved to a fresh place, particularly during the early days when the chickens are confined in a small run. When they are a little older and have their freedom, it is, perhaps, less necessary, since they wander pretty far afield, but it is certainly advantageous to move the brooders about as much as possible. A great saving can be effected in the feeding of growing chickens by allowing them to wander about in search of worms, grubs, etc.; when the soil is foul they are unable to do this, and thus the cost of feeding is increased. For economy's sake, therefore, as well as from the health point of view, must tainted soil be avoided.

CHAPTER XII

THE MANAGEMENT OF CHICKENS

THE first really critical period in a chicken's life is when it is between the ages of ten days and three weeks. I think that the bulk of poultry-keepers will agree with me when I say that quite one-third of the total deaths occur during this time. This has certainly been my experience for some years past, and I know there are others who have experienced the same thing. It is possible that one of the reasons for so high a percentage of mortality at this stage is that it is often supposed that when a chicken is ten days or a fortnight old it can in a large measure look after itself.

Many deaths are caused, too, by insufficient care being exercised in seeing that all the chickens leave the run of the brooder and go into the inner compartment as soon as evening sets in. I have known instances in which large batches of young chickens have been left in the run too long, with very serious consequences.

The utmost cleanliness must be observed in everything that comes into contact with the chickens, for otherwise death and disaster are bound to follow sooner or later, generally sooner. More diseases in the poultry-yard are due to dirt in one form or another than to anything else.

The chicks themselves, as soon as they are dry, even before they are removed from beneath the hen, should be anointed with the following mixture: 1 oz. vaseline, 1 oz. lard, ½ oz. sulphur, and sufficient paraffin oil to make a semi-liquid. This is the most effective way of keeping down insects that I know. The process should be repeated when the chicks are a month old.

The coops, houses, everything in fact which comes into contact with the youngsters, should be regularly cleaned and disinfected.

THE FEATHERING PROCESS

It is by no means a disadvantage for chickens to feather rather slowly. It is often the chickens whose frames have developed first and their feathers afterwards that attain to the largest size—in fact, it may be that they are quite big birds before the chicken fluff has disappeared. Some chickens are trim and perfect in feather and symmetry almost from the first, and they never seem to pass through the hobbledehoy stage. Such pullets seldom, if ever, reach the standard size, while they are frequently deficient in economic qualities.

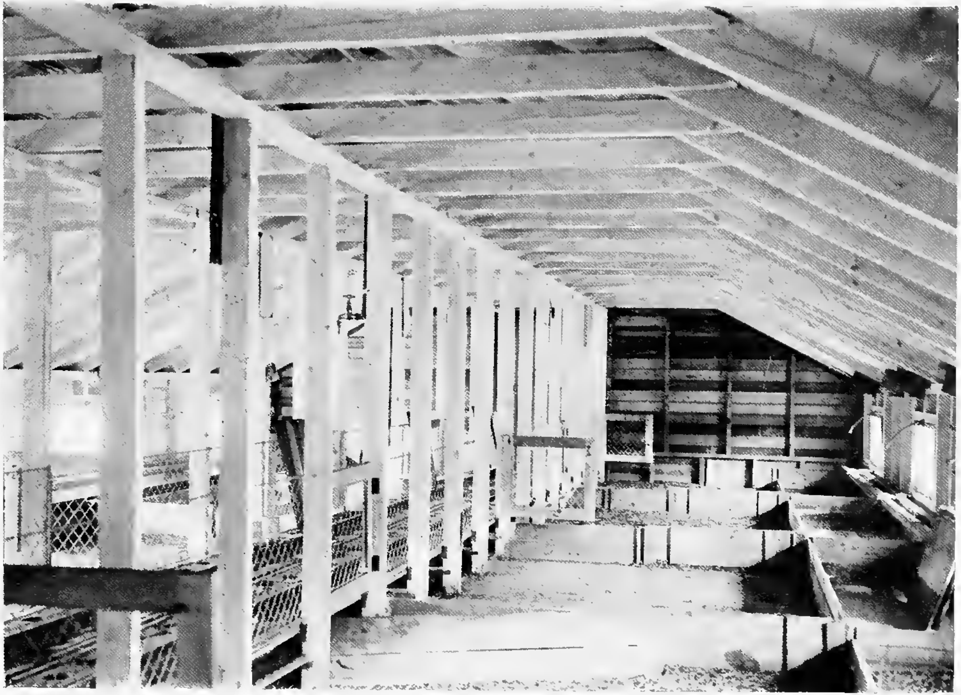
In yards where healthy chickens have been hatched from sound and robust parents their growth during the spring of the year is very apparent, and they appear to be making wonderful progress. There comes a time, however, a little later in their development, when their growth appears to receive a check, and they seem to be actually standing still. This is when special treatment is so necessary.

The age at which this stage occurs varies greatly, some breeds being a month or five weeks earlier than others. Winter-hatched chickens are always considerably later than those brought out in the spring, while the heavy varieties take much longer to complete the process than the small, active non-sitters.

It is very important at this stage to keep the chickens away from wet grass, while they must not be exposed to rain or cold winds. As a matter of fact, they are really better under cover if the weather is at all inclement. If the days are warm and fine they may be given their freedom, for under these conditions they are really better than in confinement.

FRESH GROUND ESSENTIAL

A very important item in the management of month-old chickens is that they shall have as much change of



INTERIOR VIEW OF A LARGE REARING HOUSE

Hot-water pipes run through the brooders, thus dispensing with the trouble of individual oil lamps

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An Ideal Situation for Rearing Chickens

land as the conditions will allow. Great benefit will accrue from this. It will act as an invigorating tonic, and prevent that flagging which is so common among chickens, especially where large numbers are reared. Chickens must not be cramped as to sleeping accommodation, or, however favourable may be the land over which they run during the daytime, it will be neutralised by breathing impure air at night.

The danger of overcrowding may be very largely obviated by early separation of the sexes, and this can generally be done when the birds are from seven to twelve weeks old. Even with Langshans and similar breeds, the difference between cockerels and pullets can readily be distinguished. Each of the sexes should be located at sufficiently distant parts of the holding to prevent their mixing.

This, together with the exclusion of the wasters from the flock—culling should be rigidly and systematically carried out—will far go to provide the necessary space, which is such an important factor in allowing freedom and liberty of action, and for the full exercise of the natural faculties so essential in the young of all animals

DIVIDING THE SEXES

It is a great mistake to allow cockerels and pullets to grow up together, for under these circumstances neither thrives so well. The cockerels are constantly worrying the pullets and everlastingly quarrelling amongst themselves. Very rarely, indeed, does any actual harm accrue from allowing the sexes to mix; it is rather that development is retarded, while the flesh loses much of its quality and flavour. The division of the sexes is almost invariably delayed too long. The separation should take place immediately the cockerels can be distinguished from the pullets, and the sexes should be placed quite apart, where they cannot even see each other.

It is difficult to give the age at which the division can take place, because the various breeds develop at such a different rate. The sex of the light breeds, such as

Leghorns or Anconas, can generally be determined when they are about seven weeks old, sometimes less, whereas the heavy varieties, such as Wyandottes or Orpingtons,

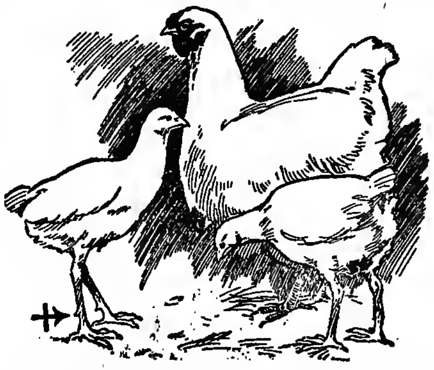

FIG. 22.—AS SOON AS THE SEX IS DISTINGUISHABLE, COCKERELS SHOULD BE PLACED QUITE APART FROM THE PULLETS. YOU CAN DETECT A COCKEREL BY THE EMBRYO SPUR, MARKED WITH A CROSS ABOVE.

cannot be distinguished under eleven or twelve weeks. Immediately, however, the sexes can be determined the division should take place.

THE VALUE OF SHELTER

The importance of shade during warm weather must not be overlooked, the lack of which will cause a large amount of trouble. Where trees or bushes or any sort of permanent shelter is available, the chickens are not slow to take advantage of it. Where, however, this does not form a part of their rearing-ground, by a little dexterous management shelter may easily be improvised—canvas, straw-plaited into hurdles, an upturned crate covered with sacking ; in fact, there is no limit to what may be employed for the purpose.

CROOKED BREASTBONES

If one takes the trouble to examine the chickens which are offered for sale on the markets and in the poulterers' shops, it will be observed that a large number, if not the majority, have crooked breasts. This is a serious fault, and it detracts greatly from the value.

Occasionally the crooked breastbone is due to hereditary tendencies, and hence it is a mistake to use in the breeding-pens any birds which possess this defect. Far more often, however, it is the result of the chickens having been allowed to perch when they were too young, before their breastbones had become properly set. It is pretty obvious that if a young chicken, with gristle instead of bone on the breast, is allowed to sleep night after night upon a narrow perch, it is bound to put the keel out of shape.

Until chickens are twelve or fourteen weeks' old they should not be permitted to perch. The best plan, if the house is dry, as it should be, is for them to sleep on soft litter on the ground. If the floor is at all damp or if there is danger from rats, a shelf four or five inches wide should be provided. It should be raised a foot or so from the ground, and it is all the better if it has a small flange, which enables it to be covered with peat moss or straw.

MARKING CHICKENS

When one keeps only one breed or variety, and does not want to sell stock for breeding purposes, it does not matter how greatly the chickens from the different pens become mixed up. They may all be allowed to run about together, for the sorting can take place later on.

It is a very different matter, however, when they are intended for selling for stock purposes the following autumn. In this case, it is absolutely essential to keep them apart. If this is not done it is impossible to sell unrelated stock, and to sell related birds for breeding is dishonest. Some follow the plan of rearing them in separate runs—a very risky proceeding, in my opinion, since a careless attendant by leaving open the gate may irretrievably mix up the different broods.

Ringing is not altogether satisfactory with very young chickens, as the legs increase in size so rapidly, necessitating the constant changing of the rings. When the birds get a little older this is the best plan, but while they are quite young it is unsatisfactory.

A simpler method is by what is termed toe-punching. A small appliance can be bought for about a shilling which performs the operation painlessly and quickly. By means of this instrument a small hole is pierced in the web of the foot. Dozens of pens can be arranged for in this manner. No. 1 pen would be pierced between the first and second toes of the right foot; No. 2 pen on the left foot; No. 3 pen one hole between the first and second toes of the right foot and another between the second and third toes of the left foot. With four-toed birds it is possible in this manner to provide for over one hundred pens.

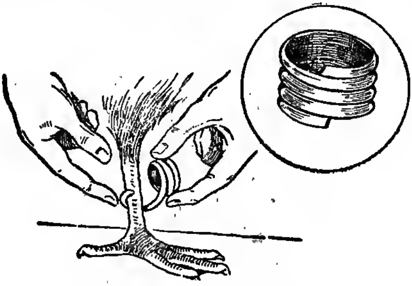

FIG. 23.—POULTRY RINGS.

THE DRY METHOD OF FEEDING

Everybody who has ever reared chickens—and especially during February and March—knows that one of the greatest difficulties to overcome is to insure the birds taking sufficient exercise. During the winter and early spring there are many days when the weather is so wet and cold that the birds will not venture out into the open. And yet, if they are to grow satisfactorily, they must take some sort of exercise. Without exercise chickens frequently contract chills, bowel trouble is extremely common, and during a long spell of bad weather, or in a location where the conditions are somewhat unfavourable, there are likely to be a good many deaths.

When chickens are fed upon moist foods laziness is encouraged rather than otherwise, since the birds speedily satisfy their appetites, and merely mope in the corners of the brooder instead of being up and doing, as every future egg-layer should. When the dry method of feeding is adopted, however, the chicks are kept busily occupied throughout the entire day. If they do not work, and work continuously, they must go hungry, and there is no greater inducement to exercise than this.

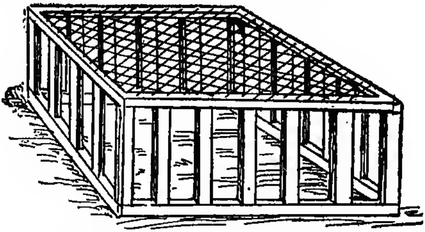

FIG. 24.—THE USE OF A FEEDING CAGE PREVENTS YOUNG CHICKENS TRAMPLING ON THEIR FOOD.

The greatest advantage, then, of the dry method of feeding lies in the increased vitality and the greater health of the chickens. But there are other advantages. Under the moist method of feeding one is constantly preparing food for the birds, from early morning till late at night, for during the first week or two of their lives they require feeding every two or three hours from about 6 a.m. until about 9 p.m.; under the dry method sufficient food is scattered once a day to last the birds for the twenty-four hours. It is thus possible for a man to attend to four or five times as many chickens as he can when feeding upon soft food. Another advantage is that the cost of feeding is reduced, and every penny that can be saved in this respect represents increased profits.

SOME DRAWBACKS

The principal disadvantage of the dry method of feeding is that the chickens reared upon it do not grow at quite so rapid a rate as do those upon moist foods. For this reason, when rearing chickens for marketing purposes (those for stock should be allowed always to grow slowly) the moist method is preferable. In this case, rapid growth is essential, otherwise the best spring markets may be over by the time the birds are ready for killing.

Another drawback is that the crops of chickens reared on dry food are smaller, and for this reason fatteners do not care for them, since they are unable to get them into a killing condition so quickly. Moreover, the flesh of chickens reared on the dry system is a trifle harder than is the case with those birds which have received soft food from the very first.

One other disadvantage there is, and that is that the method lends itself so readily to waste. The poultry-keeper should make it a strict rule never to throw down any more grain until the previous supply has been exhausted. If no food is wasted at all chickens can be reared more economically upon dry than upon wet foods. I have made many exhaustive experiments in the past, and these have all gone to prove that a big saving is effected in the food bill when feeding on grains rather than on biscuit-meal and other comparatively dear foods.

HOW THE SYSTEM IS WORKED

The way the system should be worked is to cover the floor of the brooder or coop—for the system is suitable for both artificially and naturally reared chickens—with chaff two or three inches deep, and scatter the food in this so that the chickens have to scratch to find it. This is the secret of the whole system. The chickens are scratching all day long and thus they have constant exercise, so beneficial to health and satisfactory development. It will be noticed that I recommend chaff as the most suitable litter to use; straw does answer, but it is not nearly so good.

As regards foods, there are some excellent preparations of dry chick feed on the market, but those who prefer to do so can mix their own. The following, for instance, is one which I have used extensively for some years past, and which has given good results:—

	Parts.		Lb.
Wheat	3	or	21
Dari	2	,,	14
Canary Seed	2	,,	14
Oatmeal	2	,,	14
Millet	2	,,	14
Broken Maize	1	,,	7
Buckwheat	1	,,	7
Rice	1	,,	7
Meat	1	,,	7
Grit	1	,,	7
			112

The wheat, maize and buckwheat require to be cracked, since whole they cannot be properly digested.

AFTER FOUR WEEKS

This diet should continue only till the birds are a month old, for many experiments in this country have proved that at the end of a month two meals of soft food should be supplied daily. Unless this diet is adopted the chickens experience considerable difficulty in feathering, besides which growth is retarded.

First thing in the morning, and again about 2 or 2.30 p.m. a feed of soft food should be provided. Troughs should be used for this purpose, for it is very wasteful to throw soft food upon the ground. The chickens trample upon it, making some of it unfit for eating, while if too much is provided it is impossible to collect any left over. The soft food should remain before the chickens for about a quarter of an hour, until their appetites are appeased, when any that is left should be taken away, and kept for the next meal.

Whatever is used for soft feeding should be thoroughly soaked, for this makes it more easily digestible by the birds, besides which it is more economical. This does not mean, however, that it should be supplied in a sloppy state. That must be avoided, for sloppy food causes all sorts of complaints, chief amongst which is diarrhœa. It should be given in a crumbly moist state. It is a good plan to squeeze it in the hands before putting it into the trough, as this gets rid of the surplus moisture.

THE BEST FOODS

There is nothing better than biscuit meal for young chickens. It is a cooked food, and it takes very little preparation. There is also a whole host of excellent foods upon the market, reasonable in price and high in feeding value. From the time the chickens are a month to two months old they should receive at least one meal a day of one of these specially prepared foods. The other meal may consist of ground oats, barley meal, or middlings, well-soaked, and given in a crumbly moist condition.

A feed of boiled rice at least three times a week is strongly recommended. Except as a small part of a dry chick mixture it is no use giving chickens raw rice, for it passes through their systems without providing any nutriment. Properly prepared, however, it is a most excellent food. To one part by measure of rice three parts of water should be added, and the two should be allowed to simmer gently on a fire till the rice has absorbed all the water. If skim milk is plentiful and can be used in place of the water the results will be all the better.

THE GRAIN MIXTURE

A cheaper mixture of grains should be prepared than that recommended for use during the first month. One that I can confidently advise is as follows :—

	Parts.		Lb.
Wheat (cracked)	3	or	21
Maize ,,	3	,,	21
Dari	2	,,	14
Buckwheat	2	,,	14
Rice	2	,,	14
Hempseed	1	,,	7
Meat	1	,,	7
Linseed	1	,,	7
Grit and Oyster-shell	1	,,	7
			112

Some rearers adopt a much simpler mixture, but I think it is worth while going to the trouble of using this somewhat elaborate preparation. At all events, this is my experience, for whenever I have tried the so-called simple mixtures the results have not been so satisfactory.

The method of feeding the grains is just the same as during the first four weeks. The grains should always be scattered in the litter, so that the birds have to work for their food. Exercise is the secret of success in rearing chickens ; without it they soon become unwell, and their internal organs become deranged.

WATER AND GREEN FOOD

It is very necessary indeed, when the dry system of feeding is adopted, to supply plenty of pure and fresh drinking water. Whether it is wise to provide drinking water during the first month under the moist method of feeding is a very doubtful point. But there is no doubt whatever when the dry system is adopted. The supply must be plentiful, and the water must be pure and renewed two or three times daily. The water-dishes must be kept scrupulously clean, and they should be scrubbed out once a week. They should be placed somewhere where they won't get filled with litter; a little raised platform in a corner of the run is quite a good plan.

Green food is extremely important at this stage. It is often thought that green food is the great inciting cause of diarrhœa, but this is only the case when the greens are not regularly supplied. Rather than go to any trouble to obtain them, the owner frequently allows his chickens to go without any for a long period; then when chance puts some in the birds' way they eat a huge quantity, with the inevitable result. Regularly supplied, however, green food is not only beneficial, but necessary to health and development.

CHAPTER XIII

DAY-OLD CHICKENS

Both to the seller and the buyer does the day-old-chick business offer advantages. To the seller these are obvious. He secures a good market for his birds and is able to keep his incubator going longer and to better advantage than would be possible otherwise. A man with no land can carry on this trade, provided he has the opportunity of buying eggs from a reliable source. But he must be sure that the source is a thoroughly reliable one.

To the purchaser, too, the trade is one that should appeal. Everyone has not the opportunity or the necessary capital to buy and work an incubator. If they wait for a sitting hen they may very likely be unable to bring out their chickens at the right time of the year. The purchase of chickens when newly hatched saves three weeks, and this is all-important when winter layers are required. If broody hens are not obtainable until, say, towards the end of March, the brood will not be out until the latter part of April, and this generally is too late for winter layers, but if day-old chickens are bought they can be given to the hens as soon as they are sitting well. Broody hens, if allowed to sit for a few days on dummy eggs, generally take kindly to a batch of chickens if given to them; hence natural means of rearing can be adopted.

STRONG CHICKENS TRAVEL BEST

During the last two or three seasons I have heard a good many complaints that rearing results have not been good with bought day-old chickens. In a number of instances the blame must certainly lie with the raiser, but in others the quality of the chickens sent out may account for the high rate of mortality.

I have for a long time held the belief that it is a very serious mistake to hatch eggs produced by pullets during their first laying season, for if the birds have been laying during the three winter months prior to the time their eggs are incubated, the germs in the fertile eggs cannot possess the same vitality, and hence cannot produce such strong chickens. On the other hand, if the pullets have just come into lay, the eggs are produced by immature stock, and again the result must be the same.

For many years past when hatching I have made a point of only incubating the eggs from birds in their second and third seasons, and, although not obtaining the same number of chickens per bird, I have scored in the higher vitality possessed by the youngsters, and rearing results have been very greatly improved. I believe that if the sale of day-old chickens were confined to the birds hatched from hens we should hear no more complaints of a similar nature.

DEMAND AND PRICES

Those varieties which happen for the time being to be creating the greatest public interest are the ones that are bound to be mostly in demand. Should White Wyandottes happen to win the twelve months' laying competition, for instance, one may anticipate an increased demand for chickens of this breed next season. Should Orpingtons prove successful, the increased demand will probably be for them.

At the present time, the greatest trade among the general purpose breeds is in Wyandottes, Orpingtons, and Rhode Island Reds; among non-sitters, in Leghorns; and among table fowls, in Sussex.

The prices obtained for newly-hatched chickens vary considerably according to the value of the parents, and it is impossible to give any hard-and-fast figures. Not only is the price governed by the quality of the breeding-stock, but also by the time of year, since early in the season twice or three times as much is demanded owing to the shortage of the supply. Early in the spring, when eggs are scarce, it is difficult to buy chickens of any description under about 10s. per dozen, whilst for the offspring of valuable parents, as much as 30s. or £3 3s. will be asked. As the season advances prices naturally decline, until by May and June chickens from excellent utility parents can be procured for 10s. per dozen.

This is a profitable trade to the producer, provided that it is satisfactorily carried out, as the following figures show. Assuming the cost of the egg to be two pence, and allowing for 30 per cent of fertile eggs failing to hatch (which is a very high allowance), but without interest on capital or charge for labour, the actual expense of producing chickens is about 3s. per dozen.

Making a very generous allowance for labour and interest on capital, the actual price of producing a dozen chickens early in the season should be less than 4s. Add to this the price of the box and the cartage to the station, and the total expense of a dozen chickens is well under 5s. Everything above this figure, therefore, is net profit.

PREPARATIONS FOR THE JOURNEY

The chickens should remain in the drying-box of the incubator until they are quite dry, and under no circumstances must they be dispatched before this. If the journey is only a short one—six or eight hours—they should be packed and sent away immediately they are dry, that is, when they are twenty-four hours old. In this case they should not be fed before they are sent away. If, however, the journey is more than twenty-four hours' duration, it is better to teach them to feed before sending them away, so that they can eat during the journey. Some prefer to keep them about a week before dispatching them, but I have always found it to answer better to send away as speedily as possible. If the chickens become accustomed to a brooder they do not readily take to another, and the change is liable to give them a check.

Curious as it may appear, chickens travel better when twenty-four hours old than when a couple of days, and every day after they feel the effects more keenly. Only when the weather is very severe do I recommend keeping the chickens a week or ten days before dispatching, as at this age, although they may feel the cold rather more readily, they can withstand greater hardships.

THE TRAVELLING BOX

The exact form of box used for the accommodation of the chickens is of no material importance, provided that it is well and substantially made, warm, and well-ventilated. It must be remembered that it is impossible to provide warmth for the chickens in any way; the only thing to do is to try and conserve the heat of their bodies as much as possible.

Cardboard boxes are often employed, but I think wooden ones are preferable, especially early in the season, when the weather is likely to be cold. A box to accommodate a dozen chickens should be about 14 in. by 9 in. and, say, about 9 in. high. For two dozen chickens—and it is not wise to pack more than this together—the measurements should be about 15 inches square and a similar height. There should be some holes pierced around the sides near the top of the box, so as to allow fresh air to enter. While the chickens require to be kept warm they must, at the same time, be provided with pure air. The lid and the sides should be lined with felt or flannel. That on the sides should be quite taut, but on the lid it should be fastened on loosely, so that it may rest lightly upon the birds, keeping them warm.

The bottom of the box should be lined with hay, and the lid should be tied or screwed on—not nailed, as the hammering frightens the birds and often injures them.

Prominent labels, marked *Live chickens, with Care,* should be fixed to the lid. Also the vendor must see that he has the full address plainly written. Care must be taken to select a good train, with suitable connections, because safe and rapid transit is most important. Study out the route very carefully, so as to avoid delays. Also be sure and send word to the purchaser, saying by which train the birds are travelling.

CHAPTER XIV

PETITS POUSSINS OR MILK CHICKENS

A VERY considerable trade has been carried on for many years past in France, Germany, and Belgium, in the production of quite small chickens for the table. During more recent years the demand for similar birds has arisen in this country, and, as far as it is possible to estimate future requirements, I am pretty certain that this trade will develop greatly in the immediate future.

It must not be expected, however, that the demand will assume very large proportions, since such chickens weighing from 6 oz. to 10 oz. each, are expensive luxuries. At the same time, the demand is greatly in excess of the supply, and will remain so for some years to come.

The names given to these birds vary greatly. In Britain they are called " Milk Chickens " ; in Belgium the same (" Poulets de Lait ") ; in France they are " Petits Poussins " ; while in America they are termed " Squab-broilers."

Petits Poussins are small chickens weighing from 6 oz. to 10 oz. each, and there is seldom any difficulty in realising excellent prices during the months of April, May, and June, provided that they are of good quality and colour. For especially fine birds exceptional prices are often obtained ; and at all times the return is sufficient to make the industry profitable.

A PROFITABLE TRADE

The production of Petits Poussins is a very profitable branch of the poultry industry, but the chickens must be of the right weight and of high grade quality. Only during April, May, and June—really during the London season—is there any great demand for Petits Poussins, while it naturally follows that it is only really first-class poulterers who are able to dispose of this somewhat expensive luxury.

There are several reasons why this particular trade may be so strongly recommended. For one thing, the demand is great, and prices range high, provided, of course, that a suitable breed is selected and that the birds have been carefully prepared. The overturn of capital is very rapid, for under good treatment the birds should be ready for marketing when five or six weeks old. The risk of the chickens dying is comparatively slight, owing to the fact that quite a large proportion of the mortality that occurs among young stock is after they have reached the age of six weeks.

An advantage that should appeal to those with only a limited space is that operations can be conducted on a small area ; as a matter of fact, the birds may be reared successfully in quite small runs. Close confinement is not recommended in the case of birds intended for stock purposes, but when they are to be killed when only a few weeks old no harm ensues.

THE BEST BREEDS

Some breeds of poultry are much better fitted for the production of Petits Poussins than are others, and much of the success achieved depends upon the variety selected. A suitable bird requires to possess white legs and flesh, a large breast development, small bones, and be a rapid grower. The last point is an extremely important one, since the duration of the market is so short, and prices decline so quickly, that a week or ten days longer in attaining to killing size may make as much as ninepence difference in the value.

If one is living amid very favourable surroundings, there is no better breed for the purpose than the Dorking; but this variety cannot stand rough treatment, while damp or extreme cold is fatal to the chickens. The Faverolles and the Buff Orpington are very suitable, and have an advantage over the Dorking in that they are hardy. This is a point very greatly in favour of these two breeds, for rearing during the early months of the year is never a very easy matter, and if a somewhat delicate variety be selected, the difficulty is enormously increased.

The chief breeds employed in the United States for the broiler trade are the Plymouth Rock, Wyandotte, and White Leghorn. None of these is recommended for use in this country, as they all possess yellow flesh, against which there is a strong prejudice.

FOODS AND FEEDING

On the feeding of the chickens a great deal depends, as it is of the utmost importance to get the birds into fit condition for killing with the least possible delay. The sooner that this can be accomplished the higher is the price obtained, and the more rapid the overturn of capital.

Foods of a forcing nature should be employed, as the great aim is to hasten growth, irrespective of a strong frame or healthy constitution. Were the birds to be used later on for breeding purposes, this would be a very mistaken policy ; but if they are to be killed when from a month to six or seven weeks old it does not matter.

The dry system of feeding chickens is not suitable for this class of table bird. There is no doubt that for rearing chickens for stock purposes the dry system has no equal, but when the birds have to be killed at the end of a month or six weeks, it does not produce flesh of sufficiently good quality. It has a tendency to make hard flesh, and thus the moist system of feeding has to be adopted if the finest birds are to be produced.

During the first few days hard-boiled eggs, chopped up finely and mixed with breadcrumbs or biscuit meal, should be served to the chickens, dispensing with the eggs at the end of five or six days. I prefer the biscuit meal to the breadcrumbs, as I have found the latter to cause scouring among the chickens. A cooked food should always be employed, as it is so much more easily digested by the birds.

A variety of foods, so necessary when the moist system is adopted, can be contrived by using occasionally a little oatmeal, middlings, barley-meal, or cooked rice. Once a day a feed of oatmeal should be supplied, but it has to be used with care, and has to be thoroughly swollen out before giving to the chicks.

Once a day, too, they should receive some freshly-cut bone as this assists rapid development. Green food is essential to the health of the birds, and during the time of year that fresh greens are scarce steamed clover hay may be substituted. Sweet milk should be provided for drinking purposes from the very start, as nothing else can impart so excellent a colour or flavour to the meat.

THE FINAL STAGE

Great care must be taken in the final preparation of the chickens, since appearances go a long way in determining their value. If the skin is damaged, or if there is any food remaining in the crops or intestines, it detracts very considerably from the birds' appearance, and thus from their market value.

The birds being so small, it is necessary to handle them very carefully indeed. Any carelessness in plucking or packing will seriously damage the skin and reduce the value.

Before killing, the birds should be starved for eighteen or twenty hours, so as thoroughly to empty the system of all food. If any is remaining in the crop or intestines, it makes the flesh go a bad colour and causes the flavour to deteriorate rapidly.

Before packing, the birds must be stone cold. This is most important, for if there is any heat remaining in the body, the birds will probably be bad when they arrive. Packing must be carefully done, and the box should be quite full (or else filled up with grease-proof paper and straw); otherwise the birds will shake about on the journey and be damaged.

CHAPTER XV

THE ART OF CAPONISING

A LARGE proportion of the so-called capons offered for sale during the Christmas season are so in name only. The great majority of them are merely large cockerels, which have been kept away from the pullets and fed upon a diet which produces soft flesh of good quality. Probably about 95 per cent of the real capons sold in this country come from abroad, especially France. There is an excellent demand for capons during the Christmas season and good prices are secured. In spite of this, however, it does not pay everybody to operate upon their cockerels. If there is a slump in table chickens during the spring months, and only poor prices are being realised, then it undoubtedly pays well to caponise. If, on the other hand, they are scarce and fetching high prices, then it is more profitable to market the chickens as chickens during April, May, and June.

SUITABLE CONDITIONS

The conditions under which capons can be raised most successfully are those which are usually found on farms or fairly large smallholdings. Particularly is this the case where poultry form one part of the stock maintained, or where there is ample room for them to enjoy a free range. The reason for this is that as the birds have to be fed for five or six months after they reach a suitable killing age, they are very liable to consume their ultimate profit if all the food has to be purchased. If the conditions are such that the capons can be turned out on to stubble after harvest or on to good pasture-land, they are able to gather for themselves all that is required to keep them growing steadily until it is time to fatten them for market.

Since the object in caponising is to make big birds, only those breeds which belong either to the table or to the general purpose class should be used. Cockerels ranging in age from ten to twelve weeks are the most suitable. If they are much older there is grave risk of their dying.

THE NECESSARY APPLIANCES

As the abdominal portion of the body has to be opened, it is advisable to starve the birds for twenty-four hours, in order that the intestines may be empty. Full intestines render the operation extremely difficult.

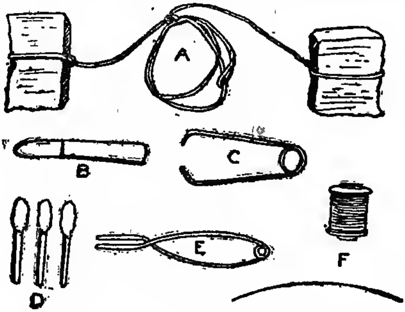

FIG. 25.—A CAPONISING OUTFIT.

A, weights for holding the bird in position; B, knife; C, spreaders for opening the wound; D, sponges made of cotton wool on the ends of matches; E, forceps; F, needle and silk for stitching the wound.

The appliances needed for the operation are a table about 2 feet 6 inches wide, a bowl of very cold water in which a few grains of permanganate of potash have been dissolved, and a couple of clean dusters. The remainder of the tools required are shown in the accompanying drawing.

The noosed end of the cord attached to one half brick is passed over the wings of the cockerel, and tightened at the shoulders ; the other is fastened round the legs above the hocks. The bricks are then dropped over the sides, the left side of the bird resting on the table.

The area which has to be plucked is douched with cold water, and the feathers are pulled out. The effect of the cold water is to deaden the sensitiveness of the skin ; thus the bird hardly feels any pain. One of the dusters is now taken, soaked in cold water, and folded so that it forms a strip some 2 inches wide, and this is placed over the feathers in front of the plucked area.

WHERE TO MAKE THE INCISION

One of the most difficult parts of the operation is to locate the exact position for cutting. Great care must be exercised in finding it. There are seven ribs on either side, springing from the backbone. The first two of these, counting from the front of the bird, are loose ribs—that is, they are only attached to the back. The remaining five spring from the backbone, take a backward direction at first, then turn at an angle of about 120 deg., go forward and join the breastbone. It is only with the two last ribs on either side—those nearest the thigh—we have to deal, and in the case of, say, an Orpington at twelve weeks old, the section attached to the backbone is about 1¾ inches long. The cut has to be made between the two last ribs from the backbone to the point where they turn to go forwards.

Pass the first finger of the left hand, commencing at the thigh, towards the front of the bird until the seventh rib is reached ; pass over this, pressing the nail between it and the sixth rib just about midway between the backbone and the angle of the ribs. Holding the finger firmly in position, insert the point of the knife—with the cutting edge towards the breastbone—to a depth of half an inch and make a cut to the angle of the ribs. With the finger still in position, the knife is taken out, turned round with the cutting edge to the back, re-inserted, and, removing the finger, the incision is continued with the knife, vertically, until the backbone is reached.

REMOVING THE TESTICLES

The spreaders are next inserted, the seventh and sixth ribs being held in the two hooks of that instrument. Surrounding the organs in the abdominal portion of the body is a fine membrane. It may happen that this membrane has been already severed by the first cutting; if not, the knife must be again used, but with caution, for it lies very close to the intestines. If there is sufficient blood in the body to make the organs indistinct, this should be soaked up by means of the sponges.

In all probability, if the bird has been well starved, the right testicle will be in view. It is a small, bean-shaped organ, yellow in colour, and is attached to the backbone. If not, by means of the forceps, the intestines should be pushed gently towards the breastbone. This will bring it into view.

Taking the forceps in the right hand, they should be inserted, slightly opened, with the ring blade towards the testicle, and a firm grip taken of that organ. With a half-turn the connection is severed, and the forceps, with the testicle, withdrawn. To remove the second testicle the operation is repeated on the other side of the bird. It is possible to remove both testicles from one side, but it is difficult.

AFTER THE OPERATION

The incision should be made as large as the length of the ribs allows. This is the better plan for the novice to adopt, but it is advisable, after one becomes proficient, to make as small an incision as possible. With a large wound it is wise to put in one stitch to draw the skin together, and for this either a surgical or an ordinary needle, slightly curved, and white silk should be used. Only the skin must be sewn, for if the flesh covering the ribs be taken up, the slightest movement of the fowl will tear it apart. When sufficient practice enables the operator to work with a small opening, it is better not to stitch the skin at all. A gas is given off from the inside of the body, and if the wound heals too rapidly the bird will become puffed up. To allow for the escape of the gas the skin will have to be pierced.

As soon as the operation is over, the bird should be placed in a small coop littered out with clean straw. For a couple of days a small amount of food should be given five times daily. It is unwise to allow the bird to fill its digestive organs until the wound is partially healed. The best food is soaked biscuit meal, dried off with middlings or ground oats, with about 10 per cent meat-meal added. After two days the bird can be given its liberty, but it is better if it is not allowed to perch for a few days longer.

The birds recover very rapidly from this operation, and the death-rate is low. A proficient operator will not lose more than 2 per cent, and frequently a whole season will pass without any mortality at all.

CHAPTER XVI

FOODS AND FEEDING

Perhaps the most common fault which is made by the bulk of poultry-keepers is that of feeding their fowls too generously. It is a thing that should be guarded against very carefully indeed, not only on account of the amount of food wasted, but because fat hens are rarely so profitable as are those which are in a lean and hard condition. Fat hens are less prolific than those which are lean, while a larger proportion of the eggs they produce is infertile, and hence of no service for breeding purposes. Fat male birds, too, are unsatisfactory, for they are unable to perform their proper functions.

However advantageous it would be, it is not possible to lay down any hard-and-fast rules as regards the correct quantities of food to be provided. This varies greatly in accordance with the breed, with the time of year, and with the conditions under which the birds are living. Some varieties require a great deal more food to maintain them in a satisfactory condition than do others. An experiment which was carried out a few years ago proved this. It showed that while a Brahma required about 17 ounces of food per day, a Leghorn could thrive capitally upon 6 ounces.

When fowls are enjoying a free range they are enabled to procure a large quantity of food for themselves, varying with the richness or poverty of the soil in animal or vegetable life. During the spring and early summer, too, when the soil abounds in natural food, obviously it is unnecessary to provide fowls with as much artificial food as it is in winter.

The only thing to do is to examine the fowls periodically, and if they are too fat their rations must be reduced; while, on the other hand, if they are too thin they must be more liberally supplied.

VARIETY IN FEEDING

As far as possible a variety in the food supplied is recommended. Fowls, like human beings, soon tire of a food that is fed week after week and month after month. Also, it should be remembered that the conditions under which fowls live, and the demands made on the system vary so greatly that one food will not do equally well in all circumstances.

A perfect food—either for animals, birds, or human beings—has yet to be discovered, perfect in so far as it is suitable under all and every condition, and for any and every class of work. If we feed a fattening bird in the same way as a laying hen failure is bound to ensue.

Fowls enjoying a free range require to be fed but once during the twenty-four hours in the spring and summer, unless the weather be very hot and the land parched. Those with a large grass run should be fed twice daily, while those which are closely confined should be provided with three meals a day. The midday meal should only be a small one, and may consist either of mash or grain.

MASH VERSUS GRAIN

A good deal of attention has lately been devoted to the question whether soft food or grain should be provided first thing in the morning. Some poultry-keepers claim that they secure better results when they supply grain for breakfast and mash at night. This may be so, but, so far as my experience goes, I have always had better results when I have adopted the opposite plan.

After the long fast of the night, during the winter months of fourteen or fifteen hours' duration, the birds require a food that can be easily and quickly digested. This is why I recommend mash. For the same reason porridge is generally eaten at breakfast and not at supper. In the afternoon grain is recommended, since in this case a slowly digesting food is beneficial.

During cold weather mash should always be given warm. Rather than give it cold it is better to feed upon grain. If the fowls take into their systems a large quantity of cold, wet food, it lowers the bodily temperature very greatly, thus reducing the egg supply.

THE VALUE OF A TROUGH

Never under any circumstances should mash be thrown down upon the ground. When the weather is dry and the ground is hard there is no objection to scattering grain, but in this case care must be taken that too much is not provided, since any that remains cannot be collected, and hence it is wasted. However fine the weather and however dry and hard the ground, soft food never should be thrown down. When this plan is followed, quite a common practice with many people, a large proportion is bound to be wasted, through the fowls trampling upon it, thus rendering it quite unfit for consumption. The mash, moreover, should not be given in a sloppy condition. It should only be crumbly moist, but must, of course, have been sufficiently soaked for all the particles of food to have become thoroughly swollen.

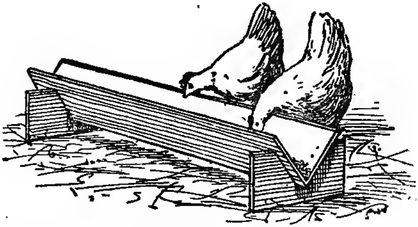

FIG. 26.—AN ENDLESS POULTRY-FOOD TROUGH IS FAR EASIER TO KEEP CLEAN THAN THE USUAL TYPE, AND ITS LIFE IS LONGER.

Sloppy mash is wasteful, besides which it encourages diarrhœa and other complaints of the bowels.

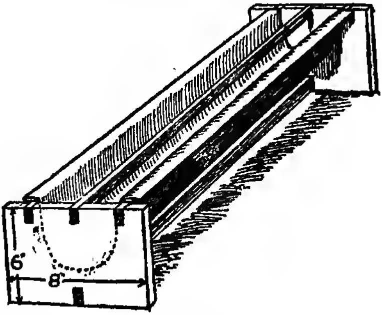

FIG. 27.—A FEEDING TROUGH WHICH HAS THE ADVANTAGE OF BEING EASY TO CLEAN AND CHEAP TO MAKE.

Soft food should always be given in a trough, and then any that remains over may be collected and used again. It is impossible correctly to gauge the fowls' appetites,

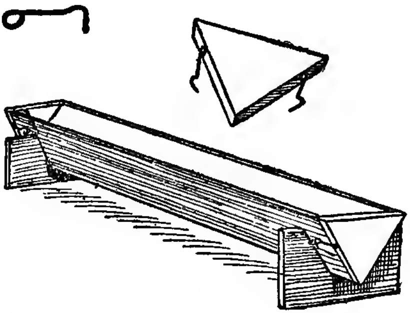

FIG. 28.—ANOTHER GOOD FORM OF TROUGH.

and thus it often happens that some of their morning meal is left.

A capital trough can be made for a couple of pence, or, if odd pieces of wood are used, for nothing. Two pieces of wood, about 4 in. wide and, say, 18 in. long, should be nailed together at right angles, while two square pieces should be fastened on to the ends, so that it may stand steadily. When a trough is used care must be taken to clean it regularly, for otherwise some of the food remains in the crevices, quickly going bad, and possibly causing disease. It should be scrubbed once a week with hot water.

The best way to feed grain to poultry is to scatter it among litter. If the litter is 6 or 8 inches deep it is all the better, as this provides the birds with exercise in scratching for it. This is one of the reasons why a scratching-shed is so beneficial. The ground should be covered with straw, or, better still, straw chaff, and the grain always scattered thereamong. It is surprising what an excellent influence the exercise which this affords has upon the health and vigour of the birds.

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NATURAL FOOD

When fowls are enjoying a free range, either over arable or pasture land, they are able to procure a large quantity of natural food for themselves. The more natural foods the birds can obtain the less money has to be expended upon meals and grains. The poultry-keeper whose space is limited, and who cannot as a consequence give his fowls their freedom, should see if he can make arrangements with a neighbouring farmer to let his fowls run over the latter's land. This can generally be arranged satisfactorily, sometimes by the payment of a small sum, sometimes for nothing, for the up-to-date farmer realises that it pays him to do so, seeing that he is obtaining a good dressing of manure for his land free of charge.

When poultry are given their liberty over good arable or pasture land there is no need to give them much else. As a matter of fact, I have on many occasions kept flocks of growing chickens and adult birds for several months at a stretch, and have supplied them with no artificial food whatever. At the end of the period they have been in better condition than the birds which have been confined in runs and fed twice daily.

THE ELEMENTS IN FOOD

There are three chief elements in all feeding stuffs, whether they be grain or meal, natural or artificial, each of which has a special function to perform. These essential elements are albuminoids, carbohydrates, and fat.

The albuminous or nitrogenous matter goes to the formation of bone, feathers, muscle, blood, eggs, etc., and hence young stock or laying hens require a more generous supply than other classes of poultry. The food supplied to growing or laying birds should contain about 15 per cent of albuminoids, while for other stock 12 per cent is sufficient.

The carbohydrates go to the production of heat and support respiration, and a more liberal supply, therefore, is necessary in winter than in summer. During the former period 65 per cent is needed to maintain the birds well and profitably, whereas during the warm season 55 per cent is ample.

The fat, while it assists in the production of heat, also has the effect of producing fat; the food, therefore, for fattening chickens should contain about 5 per cent, and for growing or laying stock about 2 per cent. Knowing the correct percentage of the various elements that the food should contain, it is easy to work out a suitable ration for each and every season of the year, and for all classes of poultry.

THE ANALYSIS OF FOOD

The following table gives the analysis of some of the principal grains and meals used in the feeding of poultry, a knowledge of which enables one to work out a correct ration for the time of year, the conditions under which the fowls are kept, and the purpose for which they are required :—

	Water.	Ash.	Albuminoids.	Crude Fibre.	Carbohydrates.	Fats.
Lucerne, Hay	16·0	6·2	14·4	33·0	27·9	2·5
Bean haulms	16·0	4·6	10·2	34·0	34·2	1·0
Cabbage	89·0	1·2	1·5	2·0	6·0	0·3
Carrots	85·0	0·9	1·4	1·7	10·8	0·2
Mangels	88·0	0·8	1·1	0·9	9·1	0·1
Pea haulms	16·0	4·5	6·5	38·0	34·0	1·0
Potatoes	75·0	0·9	2·1	1·1	20·7	0·2
Swedes	87·0	1·0	1·3	1·1	9·5	0·1
Turnips	91·0	0·7	1·1	0·8	6·3	0·1
Barley	14·0	2·7	10·0	4·9	66·1	2·3
Beans	14·4	3·2	25·0	6·9	48·9	1·6
Brewers' Grains						
wet	76·1	1·1	5·3	3·9	12·9	1·5
dried	9·3	4·2	20·2	15·0	43·6	7·7
Maize	12·7	1·6	10·1	2·3	68·6	4·7
Malt Culms	11·8	7·6	23·3	12·4	42·8	2·1
Oats	12·1	3·3	10·7	10·6	58·3	5·0
Peas	14·4	2·7	22·6	5·4	53·0	1·9
Middlings	12·1	4·1	14·1	7·3	58·2	4·2
Rye	14·0	1·8	11·0	3·5	67·4	2·0
Sharps	12·0	2·5	15·0	5·0	62·0	3·5
Wheat	14·0	1·7	12·0	3·0	67·3	2·0
Wheat Bran	13·0	5·6	13·6	8·9	54·9	3·4
Fish Meal	15·0	24·0	57·0	0·3	0·2	3·5
Linseed	12·3	3·4	20·5	7·2	19·6	37·0
,, Cake	11·8	7·3	28·7	9·4	32·1	10·7
Meat Meal	10·8	4·6	71·0	—	0·5	13·1
Palm-nut Cake	12·0	3·7	19·0	10·0	48·3	7·0
Soya Beans	10·0	5·0	33·4	4·8	29·2	17·6
,, ,, Cake	11·4	5·6	42·7	5·7	28·5	6·1

CHEAP POULTRY FOODS

A cheap poultry food is only cheap in as much as it gives good results. Wheat, barley, oats, maize, and their corresponding meals, may be expensive, but if blended properly with other foods they may be considered reasonable when the effect they have upon the stock is taken into consideration. Even without these foods, however, good mixtures may be compounded if care be exercised. The aim in feeding poultry should be to provide them with a sustaining diet at a small cost, and below are given some rations which I have personally tried with very good results.

ROOTS FOR POULTRY

Mangels, swedes, and turnips, although not possessing a very high feeding value, are useful for supplementing a little meal or grain. These should always be given raw. A few roots, cut in half and suspended from the roof of the scratching-shed or run, not only provide food, but also a certain amount of exercise, without which fowls will never remain healthy.

Potatoes can be used in fairly large quantities with very good results. And the small, misshapen potatoes, or "chats," are equally suitable as the well-formed tubers. It is no use giving raw potatoes to fowls, however. To be of any real service they must be cooked. Many poultry-keepers have a strong prejudice against potatoes as a poultry-food. They have perhaps tried them and obtained poor results. This is not because potatoes are at fault, but because they have been used too generously. They must be used in moderation if they are to yield satisfactory results. If used alone they are too fattening. When mixed with other meals, however, they are a good aid to egg production, they are suitable for growing stock, and they are valuable for fattening purposes.

THE VALUE OF HOUSE-SCRAPS

A great saving can be effected in the feeding of fowls by using up all the house-scraps. These generally possess a very good feeding value. With the high price of all food, however, house-scraps are much more scarce than they used to be in pre-war days.

But no matter how economical the housewife there are always bound to be some scraps. Nothing whatever of this description should be wasted. It should be cooked, chopped up, and then dried off with a little meal. This makes a capital ration for laying hens, one of which they are very fond and one that is nourishing.

THE VALUE OF FISH MEAL

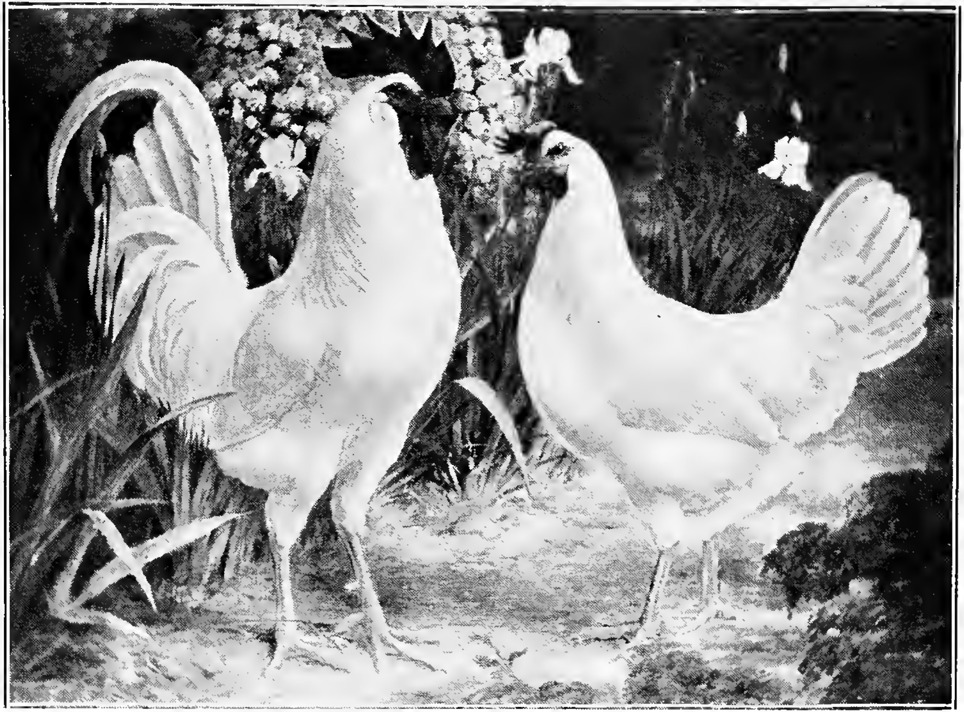
The great value of Fish Meal as an addition to the diet of fowls is now fully realized and regarded with high favour by poultry keepers everywhere. Not only does it help to rear strong, plump, healthy birds, but, what is of more interest to poultry keepers, it largely helps to produce an abundance of eggs throughout the whole season. Its use should, therefore, be on a larger scale than it is at present. It is desirable, however, to use it with discretion, for it must be remembered it is a highly concentrated food, and birds should not be overfed with it at one time. About one-eighth is, as a rule, a sufficiently large proportion to get the most beneficial results.

BLOOD AND GREEN FOOD

Blood is extremely useful as a poultry-food. It may be collected in pails from the slaughter-house, and then boiled. In order to do this it is necessary to cut up the clots with an iron spoon, and then drop them into boiling water that must be kept on the boil. This turns the clots a brownish colour. After boiling it will keep for eight days or so in winter, and three or four days in summer. If used at once, it may be mixed with the dry meals.

A very great saving can be effected by using a large quantity of greenstuff, a little raw, but the greater part cooked, for when cooked it goes much further and is made much more digestible. All sorts of garden produce can be used with excellent results. When fresh greenstuff is scarce an excellent substitute can be given in the form of steamed clover chaff. This possesses a capital feeding value and is greatly relished by the birds.

Cut green bone is largely used as an adjunct to the soft food of growing chickens and laying stock especially, and is highly useful because of the large proportion of soluble lime it contains. Bones for cutting as green bone



WHITE LEGHORNS
The premier laying variety

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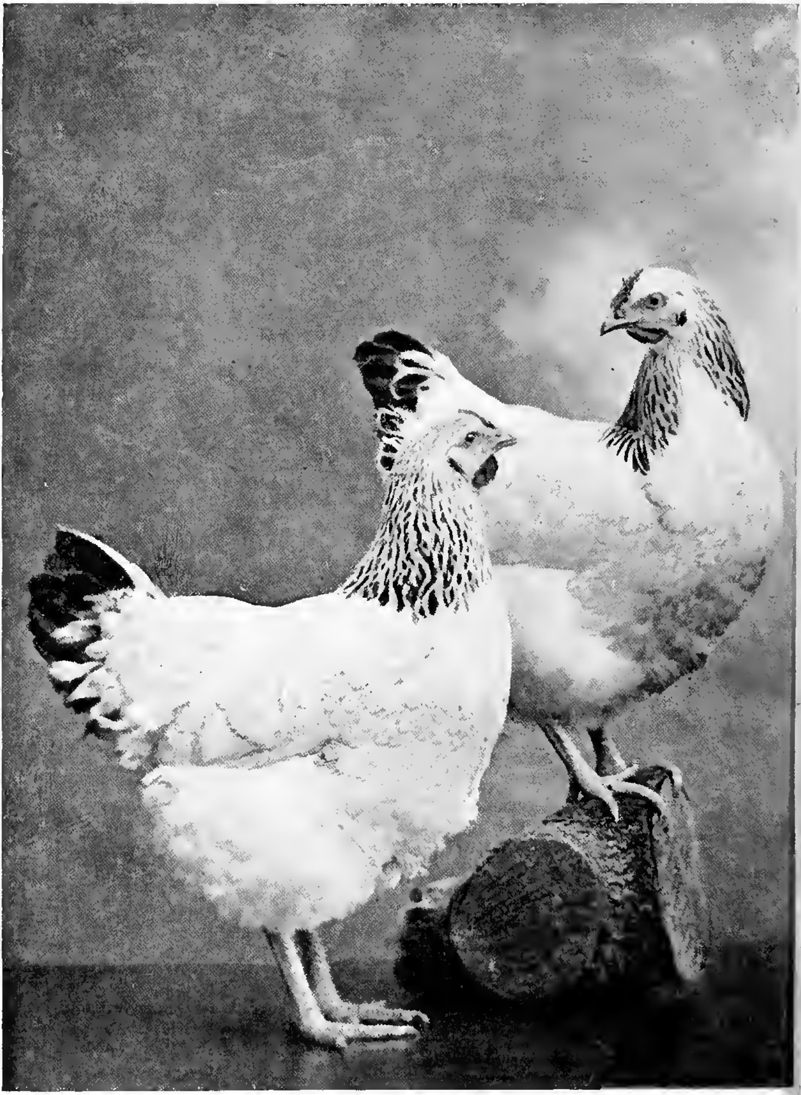

Columbian Wyandottes
A useful variety and good winter layers

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for fowls should be used up while fresh, and not kept until they become mouldy. About one ounce per day for each good-sized hen is a fair allowance: it should be

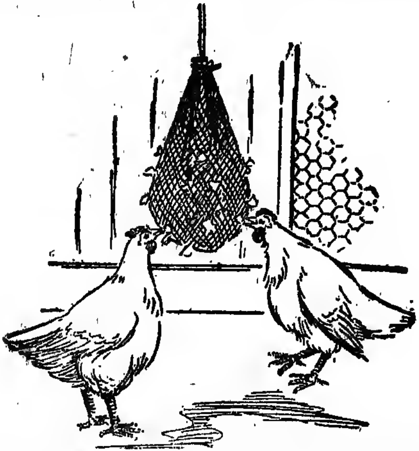


FIG. 29.—THIS IDEA OF FEEDING GREENSTUFF IN BAGS HUNG IN THE RUN IS NOT NEW, BUT IT IS ONE OF THE BEST FOR MAKING FOWLS TAKE EXERCISE.

fed about three times a week. Care should be taken that the bones are well cut and crushed. Patent bone mills for cutting green bones to pulp can be bought at a reasonable cost.

THE IMPORTANCE OF GRIT

When fowls are kept in confinement they require to be supplied with an abundance of natural food. By natural food we mean such things as grit, lime, worms, weeds, etc.

Grit is of the utmost importance, especially when fowls are kept only upon grass. If there is a gravel-run the birds are able to obtain sufficient for a certain length of time, but when they are only upon grass they require to be supplied with as much as they want. By grit is meant small, sharp particles of flint, broken glass, etc., by means of which the birds are able properly to assimilate their food. The grit passes down into the gizzard, where it remains for some time, and its action is to grind up the food into very small pieces, so making it more easily digestible.

Laying and growing birds require a certain amount of lime, the former for the egg-shells, the latter for the formation of bone, etc. One of the most frequent causes of egg-eating is due to the fact that the birds have not enough lime, and as a consequence peck at their own eggs for the sake of supplying the want.

SOME SUITABLE RATIONS

The following are some good rations for laying hens during the winter months, which have the advantage not only of being cheap, but also of being of a nourishing nature :—

1.—3 parts	by weight	Middlings.
3 ,,	,,	Cooked Cabbage.
1 part	,,	Meat Meal or Fish Meal.
2.—3 parts	by weight	Bran.
2 ,,	,,	Bean or Pea Meal.
3 ,,	,,	Cut Clover Chaff.
1 part	,,	Meat Meal or Fish Meal.
3.—2 parts	by weight	Barley Meal.
2 ,,	,,	Bran.
2 ,,	,,	Cut Green Bone.
2 ,,	,,	Clover Chaff.
4.—4 parts	by weight	Potatoes.
4 ,,	,,	Bran.
2 ,,	,,	Brewers' Grains.
½ part	,,	Meat Meal or Fish Meal.
5.—4 parts	by weight	Potatoes.
2 ,,	,,	Maize.
1 part	,,	Bean Meal.
½ ,,	,,	Meat Meal or Fish Meal.

6.—3 parts by weight Middlings.
3 ,, ,, Cooked Cabbage.
3 ,, ,, Brewers' Grains.

For summer use the following are recommended :—
1.—3 parts by weight Middlings.
3 ,, ,, Cooked Turnips.
2 ,, ,, Brewers' Grains.
1 part ,, Meat Meal or Fish Meal.
2.—3 parts by weight Brewers' Grains.
3 ,, ,, Bran.
3 ,, ,, Clover Chaff.
1 part ,, Meat Meal or Fish Meal.
3.—3 parts by weight Cooked Potatoes.
3 ,, ,, Bran.
1 part ,, Meat Meal or Fish Meal.

STIMULANTS

It is a very debatable point whether stimulants are really necessary for laying-hens. I have known them used with conspicuous success, but one is rather afraid to advocate them since so often they are abused, and supplied in far too generous quantities.

There are generally full instructions accompanying each packet, and these should be read and followed very carefully. Under no circumstances should the quantities recommended be exceeded, for it stands to reason that the manufacturers advocate as generous a supply as possible, since the more that is used the larger the sales.

Only during severe weather do I recommend the supply of stimulating powder, and then only to laying-hens. Other kinds of poultry do not require stimulants ; in fact, they are all the better without them.

THE DRINKING WATER

A liberal supply of pure, fresh drinking water should at all times be available for poultry. The drinking vessels should be kept scrupulously clean, being scrubbed out with boiling water at least once a week. They should always be placed in a sheltered position, so that during the winter they are protected from the frost and during the summer from the direct rays of the sun.

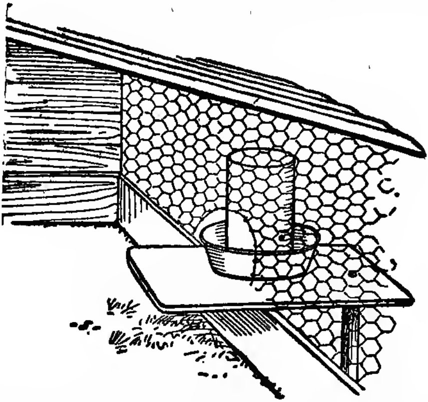


FIG. 30.—WHEN THE POULTRY DRINKING-FOUNTAIN IS PLACED IN THIS POSITION THE WATER IS NOT ONLY KEPT CLEAN, BUT IS ALWAYS AVAILABLE TO THE FOWLS, WHETHER THEY ARE INSIDE OR OUTSIDE THE RUN.

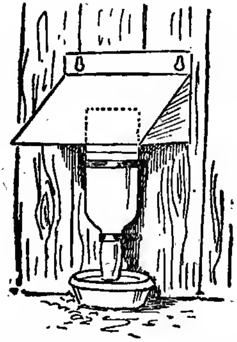


FIG. 31.—THE BOTTLE FOUNTAIN. AN EXCELLENT AND QUITE INEXPENSIVE FORM.

CHAPTER XVII

FATTENING CHICKENS FOR MARKET

QUITE seventy-five per cent of the fattening that is done in this country is conducted in Surrey, Sussex, and parts of Kent. Just why the south-east corner of England should possess almost a monopoly in this business it is difficult to say, but so it is. In very many cases the fowls have been hatched and reared elsewhere, and are merely sent to this south-eastern corner of England to have the finishing touches put on them.

The fame which Surrey and Sussex chickens have achieved has led many to suppose that there must be some special reason that makes these places particularly suitable. This is not the case, however, and there are scores of districts scattered up and down the country where chickens can be fattened just as well and just as quickly as in Surrey and Sussex.

Very few fatteners attempt to rear their own chickens. As a matter of fact it would be almost impossible for them to do so, for it is a comparatively small establishment that does not turn out an average of 300 chickens per week. To do this means that upwards of 16,000 chickens would have to be hatched, necessitating the maintenance of a huge stock of breeders or else the purchase of about 25,000 eggs. Fattening is a highly specialised business and demands constant care and attention, and this would be impossible were hatching and rearing also carried out.

Fatteners are always only too anxious to buy up all the available chickens they can, and there is a good opening in this connection for smallholders who live within fifteen or twenty miles of a fattening establishment.

Higglers, as the collectors are called, scour the country day after day buying all the suitable birds they can, and reselling them to the fatteners at a small profit.

Excellent prices are given for chickens that suit the purpose, and chickens at fourteen weeks old realise prices which are more than sufficient to cover the cost of production. As a matter of fact many fatteners claim that the rearer makes a great deal more profit than *they* do ; but I doubt this.

The actual cost of fattening a chicken for the three weeks is 1s. 5d., which includes labour, food, etc. The average value of fattened chickens varies considerably, but they are of the highest value during April and May. Without giving exact prices, impossible at the present time, it may be stated that the returns from this branch of the industry are so good that many poultry keepers cater for this trade alone.

A SUITABLE BREED

To transform a poor-conditioned chicken into a plump and white-fleshed one takes about three weeks ; that is, of course, provided that the fattener knows his business well. If unsuitable food be employed, or if the operator lack experience, the chicken loses flesh instead of gaining it, and this is what happens very often with those who are new to the work.

More than this, to achieve the most satisfactory results a suitable breed must be chosen. It is of small use spending time and money in endeavouring to fatten a Minorca or a Campine. One might almost as well attempt to fatten a greyhound. The best of all breeds is the Dorking, but it is delicate, and rearing the chickens early in the season is a difficult task. A hardier breed and almost as good in its table properties is the Sussex. Then follows the Faverolles, the Orpington, Wyandotte and Plymouth Rock. The Indian and Old English Games are most valuable for crossing purposes. Pure they do not make really first-class table chickens. Of the non-sitters, the Scotch Grey and the Houdan are the best so far as table properties are concerned.

SPRING CHICKENS

Spring chickens which are to be killed when they are very young, when they weigh only about 2½ lb. to 3 lb. cannot stand a very long process. With such birds I have always found that they kill in better condition at the end of a fortnight than at the end of three weeks. Very often they seem to go backwards when the period of confinement is too long.

The birds must be confined, for if they are running about at liberty they do not fatten nearly so well, Exercise means that some of the food is being expended in renewing waste tissue rather than going to the production of meat. These birds can be accommodated in ordinary fattening cages. I prefer, however, to house them in small sheds, with well-littered floors, keeping some two dozen together.

Three meals a day in these circumstances are recommended, convenient hours being 7 a.m., midday, and 5 p.m. As soon as the birds cease to eat hungrily the troughs should be removed, and no more food given to them until the next meal. It is just as bad for chickens as for children to eat between meals. The food should be given in a consistency of thick cream. No drinking water or green food is required.

OLDER BIRDS

Rather different treatment is recommended for older birds—that is, for birds that are sixteen to twenty weeks old. The chickens are placed in fattening cages, made entirely of laths of wood, 6 feet in length, 18 inches wide, and 15 inches high, and divided into four compartments. Each section accommodates three or four fowls. These cages can be placed in the open air during the first ten days, in which case a roof must be fitted. A trough is attached to each cage, and the birds are fed twice daily.

It is a wise precaution to dust the birds with a disinfectant powder just before putting them into the cage. This keeps down insects and makes chickens happier and more contented. Particular attention should be paid to the parts beneath the wings and on the back immediately in front of the tail.

Before giving chickens their first meal they should be starved for about twelve to fifteen hours, in order to empty their systems and so make them eager for their food amid such new and strange surroundings. If they are fed as soon as they are put into the cages there is often great difficulty in persuading them to eat at all readily. The best plan is to place the chickens in the cages towards evening, giving them their first meal the following morning.

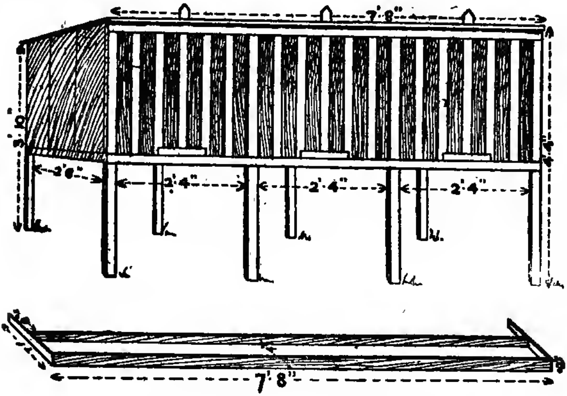
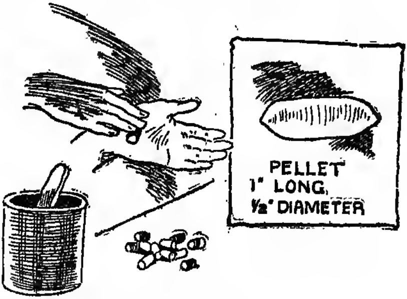


FIG. 32.—A GOOD TYPE OF FATTENING-CAGE.

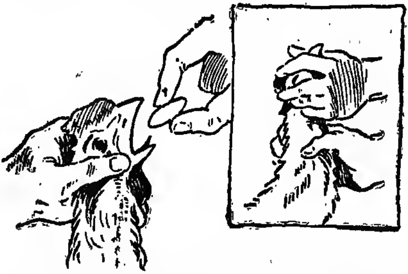
WHEN CRAMMING PAYS

The complete fattening process occupies about three weeks—ten days to a fortnight in the outside fattening cages and a week to ten days in the cramming-shed. There are two stages when the birds may be killed and marketed, namely, at the end of ten days to a fortnight, when their natural appetites fail, or else at the end of the complete process. Only when one is supplying a really tip-top market does cramming pay. For the ordinary market or for supplying private customers it usually pays to market the birds at the end of the first stage, when they are greatly improved.



FIGS. 33 AND 34.—WHEN CRAMMING FOWLS, ROLL THE FOOD INTO PELLETS, AS SHOWN,—

At the end of ten days to a fortnight the appetite usually begins to fail, and that is the moment when the chickens must either be killed and marketed or else taken into a shed and crammed. Four methods of forced feeding are in common use, namely, by machine, funnel, hand, and mouth. There is little to choose between these methods so far as results are concerned; the difference is in the time and labour involved. If a large



—SLIP THEM INTO THE CHICKEN'S MOUTH, AND WORK THEM DOWN INTO THE CROP WITH YOUR FINGERS.

number of birds is being prepared, the machine method is the only feasible one, as the others are so slow. Cramming by machine is extremely quick, a good man being able to feed about three hundred and sixty birds per hour.

When cramming by hand the food is made into a stiff paste (in the former case it requires to be of the consistency of cream), and is rolled up into balls or boluses, each about ½ inch in diameter and an inch or so long. A bolus is placed in the bird's mouth and is pushed down with the forefinger as far as it will go; the operator then withdraws his finger, and, pressing from outside with the first finger and thumb, works the food downwards and into the crop. It takes generally from twelve to twenty such boluses to cram an ordinary-sized chicken.

Cramming by funnel is done in pretty much the same way. An ordinary tin funnel is used, the neck of which is inserted in the crop, and the food is poured down. In the case of cramming by mouth the operator fills his own mouth with the food, places the fowl's beak between his lips, and squirts the food down into the crop.

THE BEST FOODS

A very great deal depends upon the foods provided and the way in which they have been prepared. If an unsuitable diet is supplied the birds will not put on flesh at all quickly, or else the meat will be of poor quality.

Sussex ground oats is the best of all foods, for it produces flesh of excellent colour, texture, and flavour. A rather cheaper mixture, but one which is not quite so good, consists of equal parts ground oats and middlings, while a much cheaper preparation still is composed of one-third ground oats, one-third barley-meal, and one-third maize-meal.

For producing first-class specimens maize-meal should be avoided, for it goes to the production of fat rather than flesh. To add weight to a bird, irrespective of quality of flesh, there is nothing better, and for this reason it is frequently employed ; but it is doubtful if its advantages offset its disadvantages.

Some fat should be added to the food, a little at first, gradually increasing in quantity as the period advances. About the eighth day after the birds have been penned ½ oz. of fat per bird per day should be provided, and after that a little more each day until at the end of the three weeks 1 oz. is being given daily.

A little powdered sulphur mixed with the food keeps the chicken healthy, while, as recommended above, each bird should be dusted with a disinfectant powder before being penned and again half-way through the period.

CHAPTER XVIII

MARKETING POULTRY

It is of little use spending time and money on the fattening of chickens for market unless the final processes—the killing, plucking, shaping, and packing—are done carefully. Appearances always go a long way in determining the value of any article of food, and if the chicken is badly killed or plucked, if it has been packed before it was quite cold or in an unsuitable crate, it will not command a ready sale or a good price.

METHODS OF KILLING

It is most important properly to starve birds before they are killed. This is in order that the crop and intestines may be emptied of food, as the keeping qualities and flavour are thereby considerably improved. If a chicken is killed soon after a meal and while its crop and intestines are full of food, the quality of the flesh will be greatly impaired.

The most expeditious system of killing is by dislocation of the neck. Dislocating the neck, properly performed, results in the breaking of the spinal column, and the blood drains completely from the body veins into the neck. The mode of procedure is as follows: Take the bird by the legs in the left hand, catching the extreme ends of the wings in the same hand in order to prevent the fowl from fluttering; then firmly grip the bird's head between the first and second fingers of the right hand, the palm of the hand being uppermost, and exert pressure on the top of the bird's head, the back of the fowl being held upwards. The legs should be held against the left hip of the operator, and the head laid against the left thigh, near the knee. The neck and body of the fowl should then be quickly and firmly extended, at the same time the head should be suddenly bent backwards, so that the neck is dislocated just below the junction with the head, and death immediately follows. Muscular contraction will last a few minutes, and it is not wise to place the fowl on the floor, or its flesh may get damaged.

PLUCKING

Plucking should commence the moment that the bird is dead, since the feathers then come out more easily, and there is less danger of tearing the skin, which not only reduces the market value, but also gives the fowl a very unpresentable appearance. If the feathers are allowed to remain on, it will prevent the bird from getting cold—especially in hot weather—and thus spoil the flesh.

It is essential that the whole time that plucking is proceeding the head shall be allowed to hang downwards; this enables the blood to flow into the neck and head, so that the desirable white colour is secured and maintained. Unless plucking is done while the bird is warm, it should not be commenced before it is quite cold, that is, at least twelve hours after killing. In plucking, the operator should be seated, and should hold the bird on the knees by its legs. The feathers are drawn by a firm yet gentle pull towards the head, this action loosening them from the skin.

The most delicate parts should be attacked first, namely, the breast, on the back of the wings, and on the back just in front of the tail. In this order there is less danger of tearing the flesh or skin. Chickens should be plucked quite clean, except for the head and half of the neck.

SINGEING AND SHAPING

After a bird has been plucked and the stubs (short little quills) extracted, it should be very carefully singed, in order to remove the hairs from its carcase. The latter is best done by setting a light to some brown paper, wheaten straw, or taper shavings, and then, taking the fowl by the head in the left hand, and the feet in the right hand, stretch it out, pass it quickly through the flame, then turn it and pass it through a second time. A gas-jet may be used for the purpose, but great care must be taken not to blacken the skin of the bird, and thus disfigure its appearance.

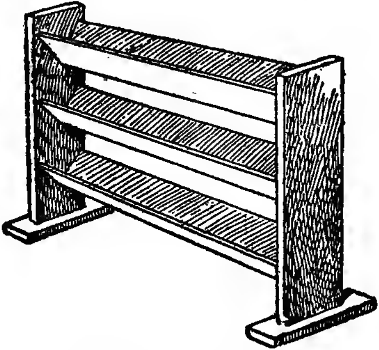


FIG. 35.—A SHAPING BOARD.

When the plucking is completed, and the bird still warm, it should be packed tightly, breast downwards, in a shaping trough, with the head hanging over the front board. A narrow board should then be placed upon the back, heavily weighted, a common method being to use a 9 lb. brick to two birds. In placing the bird in the trough, the stern is pushed hard up against the back board, this giving the bird a shortened appearance and attractive shape after being left in position for ten or twelve hours for the flesh to set and cool. Shaping troughs are usually made to hold eight or twelve birds. The sides of the troughs should be about 6 inches wide, and composed of two boards placed and fastened together at an angle a shade less than a right angle.

Before a fowl is placed in the trough, squeeze out anything possible from the vent, after which the legs should be tied loosely at the hocks.

PACKING

It is necessary to pack chickens for market very carefully indeed, since the flesh and skin are tender, and get damaged very easily. A hamper or crate, or, better still, a Sussex " ped " should be used, and it is important to pack the birds quite tightly, so that they can't move about on the journey. The advantage of the Sussex " ped " is that all the framework is on the outside, and thus there are no roughnesses to damage the skin or flesh. It pays, I think, to wrap each bird up in a piece of grease-proof paper or linen, as this protects it from harm.

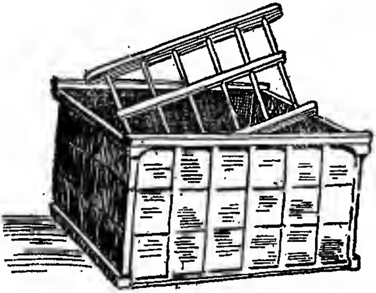


FIG. 36.—THOSE WHO SEND DEAD POULTRY BY TRAIN WILL FIND THE SUSSEX "PED," ILLUSTRATED ABOVE, THE BEST PACKAGE.

HOW TO TRUSS A CHICKEN

The poultry-keeper who is catering for a private trade —and this is certainly a more profitable business than sending to market—should learn how to truss his birds. If they are sent all ready for cooking a higher price can be procured.

The appliances necessary are a sharp knife, a 10-inch needle, and two pieces of fine white string each about 2 feet long.

The first step is to remove the internal organs and trim certain parts of the bird. The fingers of the wings and the rough skin in which the quill feathers were embedded should first of all be cut away. Place the bird breast downwards on the table with the head away from the operator, make a small incision in the skin about 1 inch from where the neck joins the body, then cut off the neck at the joint, pushing the whole away from the body, and cut through the remainder of the skin about 3 inches from the crop.

With the thumb the crop should be loosened, and cut out as close as possible to the body. By placing the bird back downwards on the table, and inserting the middle finger of the right hand into the opening, turning it gently round by the body wall, the organs in the front of the body can be loosened. The bird is then rested on the merry-thought end, with the breast towards the operator. A small cut is made between the vent and the " parson's nose," a finger inserted to find the trail—the last part of the gut—and the vent cut off.

Place the bird on its back on the table, pass the finger over the gizzard, take a grip of that organ, when the whole of the body contents should come out at once. There is no necessity to wash out the bird. The merry thought, or wishbone, is quite near to the surface, and it is advisable to remove it, as it makes carving easier. The thin coating of flesh over the bone should be scraped away, the knife inserted behind the bone, and cut away. The chicken is now ready for tying up.

Lay the bird on the table, with the front part to the left, and press the legs forwards and downwards. Pass the needle through the body as low as possible and close to the juncture of the drum stick with the thigh. Next, turn the bird over, pass the needle between the bones of the forearm and out through the bones of the hand, passing through the other wing in the reverse way. The piece of skin covering the opening where the neck was cut off should be tucked under the string between the two wings. The two ends of the string are now together and should be tied tightly.

What Table Chickens Should be Like

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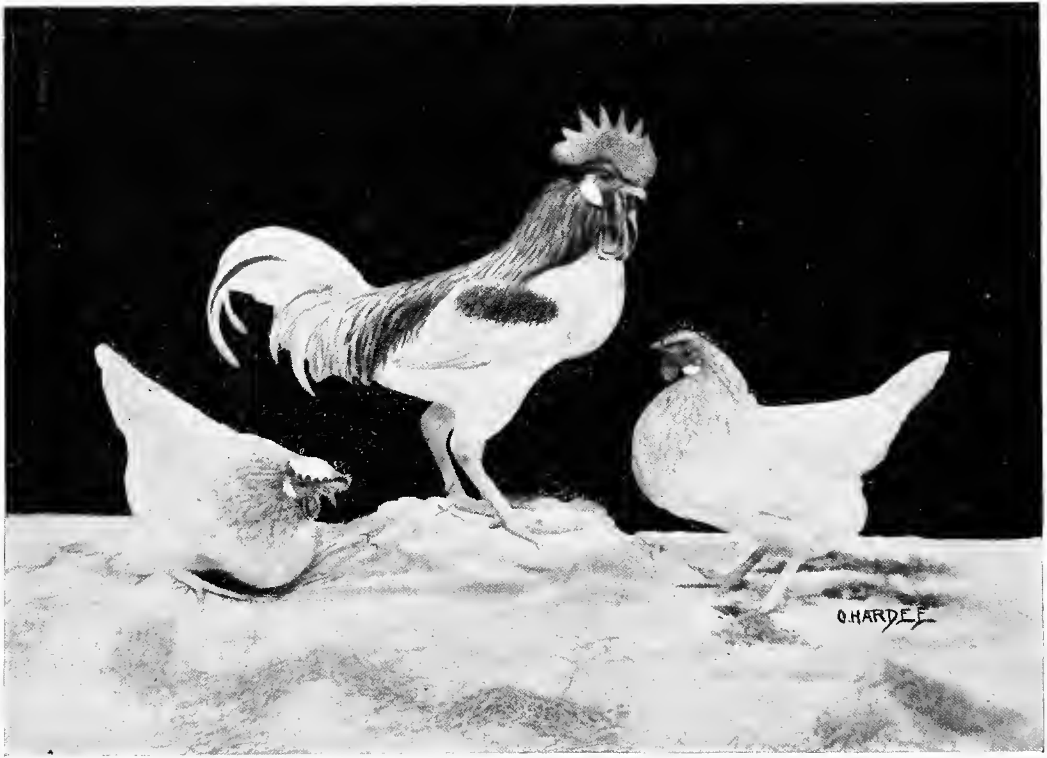

A TRIO OF PILE LEGHORN

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To finish, pass the needle through the fat at the root of the "parson's nose," wrap it once round, take it over the near leg, pass through the gristle at the end of the breastbone, over the other leg, and tie as firmly as possible.

CHAPTER XIX

MARKETING AND PRESERVING EGGS

To anyone who thinks about the matter it must seem surprising that with so perishable an article as an egg the foreigner should have a chance to dominate the market. It is all the more so, too, when one considers that by reason of climate and soil the finest eggs in the world, taking the produce generally, are those laid in the United Kingdom, though some parts of France, Denmark, and New Zealand run very near in this respect. It is a question of moist atmosphere acting upon the soil and producing that richness of natural food which gives the size, flavour, and nutrition to the egg.

Much of course can be, and is being, done to improve British eggs by scientific methods of breeding, feeding, and management, but it is a huge factor that our conditions are all in favour of home production and producers. Given, therefore, that the system of marketing allows one to place them in the hands of consumers while they are in the best condition, and while really new-laid, there is no product from other lands which can compare with British eggs for nutritive value and flavour.

LESSONS FROM ABROAD

If only farmers and smallholders would grasp their opportunities, we should have little to fear from our foreign rivals. It is just because they will not recognise the importance of speedy marketing that the poultry-keepers of France and Denmark secured so firm a hold on the trade in pre-war days. British poultry-keepers should aim only to supply the new-laid egg ; they should contemptuously refuse to cater for any other trade. The methods of collection and distribution in vogue in some of the continental countries are excellent, while so far as grading and packing are concerned, the foreigners can certainly teach us some useful lessons. The fact that the countries of production are comparatively a long way off makes it impossible for the eggs to arrive in this country before their first freshness has departed. While it is true that we ought to have little to fear from French and Danish poultry-keepers, unfortunately it too often happens that their eggs actually arrive in better condition than those produced within fifty miles of London.

An excuse, which I am constantly hearing, to account for the large quantities of eggs that were imported into this country is that abroad the conditions are more favourable, and eggs can be produced more cheaply. I have been in upwards of a dozen countries in Europe, as well as in the States and Canada, and I can confidently state that nowhere are the conditions more suitable to poultry than they are at home.

Where the foreigners score so heavily is that they have realised that the eye is the inlet to the pocket as well as to the soul. The consignments from abroad arrived in excellent condition; the eggs were well packed, clean, and graded into three, occasionally six, sizes, whereas many of those produced at home are badly packed and dirty, while all shapes and sizes are mixed together.

FRESHNESS NECESSARY

The point of supreme importance in the marketing of eggs is that they shall be new-laid. Unless this matter is realised, and acted upon, all else is in vain. An egg that is more than three days old has no right to be termed new-laid, although many millions upwards of a week or ten days old are sold under this alluring but totally false name. Until it is realised that an egg is a perishable article, equally as much so as milk, we shall never dominate the trade. Speedy marketing is, therefore, a matter of extreme importance.

To obtain the best prices for eggs, however, it is not only essential to insure their being fresh, but they should also be quite clean. Rather than send a dirty egg to market it should be washed, though since there is as much bloom on a new-laid egg as there is on a grape, which washing entirely removes, this should never be done if it can be avoided. The nests and places where the birds lay should be clean, and then the eggs cannot be soiled. Not only is the appearance of a dirty egg distasteful, but the flavour is injuriously affected. There are few things more easily influenced by its surroundings than an egg.

THE GRADING PROCESS

A very important lesson that we may learn from our foreign rivals is the advantage of grading our eggs into their respective sizes. All the foreign eggs that arrive in this country are divided into three sizes, and only eggs of a certain size are packed in the same crate. A mark is put on the outside denoting the size of the contents, and so well is this done that dealers rarely examine a crate of foreign eggs, since they know they are honestly described.

Dealers tell a very different tale about the English article, and they invariably examine the contents of a crate which is sent them, because in many cases the large eggs are placed upon the top row, and the small ones beneath—a foolish and dishonest proceeding. If the method of selling eggs by weight and not by number were adopted it would be fairer to both parties, but until its adoption, grading eggs before sending them to market is strongly recommended.

The process of grading is quite a simple one. In France a board is used with three holes pierced therein the shape of an egg, but varying in size. The eggs that pass through the smallest hole are one size, those that pass through the second are the middle-sized eggs, while those that pass through the third are the largest. Any abnormally large eggs should be kept at home, as they merely dwarf the others. In Denmark the usual method of grading is by hand, but to do this satisfactorily requires a great deal of experience.

PACKING EGGS

A dirty egg should never be sent to market under any circumstances. This is just the point in which the Irish egg of ten years ago failed so badly. It was largely owing to the shocking manner in which the eggs were dispatched which led to the great slump in the trade. "Give a dog a bad name, and hang him," applies to the Irish egg, for even to-day, in spite of the great improvements which have been made in that country, the Irish egg is still regarded with suspicion by many people.

Clean straw should be used for the packing, or, better still, wood-wool, which is made especially for the purpose, and can be procured very cheaply. Whatever is used, however (and it really does not matter what), must be clean, otherwise the eggs will be affected, and their value reduced.

It is usual when the supply marketed is not very great to use returnable boxes, but when dealing in large quantities non-returnable wooden crates should be used.

THE PRESERVATION OF EGGS

Everybody knows that at certain seasons of the year eggs are plentiful and cheap, while at other times they are very scarce, and consequently very dear. We have not yet been able to master properly the maintenance of a regular supply of eggs throughout the year. Were we to do so, the benefits of preservation would, of course, at once disappear.

A great deal can be done towards this end, however, by hatching at the right time of the year, by selecting suitable breeds, and by careful feeding and good housing. But so many fail to realise the vast importance of this question that comparatively few lay themselves out to secure an abundant egg yield during the winter months. This being the case, it is obvious that if eggs can be kept from the spring and early summer, when eggs are plentiful and prices low, until the scarce and expensive season, there is a very considerable profit to be made.

NEW-LAID EGGS ONLY

It is, however, only a waste of time and money attempting to preserve anything save absolutely new-laid eggs. Failure is bound to ensue if the first freshness has gone before the eggs are put into the preservative. The sooner an egg can be "put down" after it is laid, the better will it be when it is taken out. As a matter of fact, eggs more than forty-eight hours old are not of much value for preserving. It is also a waste both of time and money preserving dirty eggs, for in this case, even though only a few are dirty, it is bound to affect the flavour and keeping qualities of all the others. Only perfectly clean eggs should be put into the preservative.

Infertile eggs preserve better than do those containing a germ. This is not a point of very great importance, but all the same it is worth studying. Hence, when producing eggs with preservation in view, it is a good plan to have no male bird with the hens.

It must not be imagined that preserved eggs are equal to new-laid, for they are not. There is no system whereby it is possible to retain the original flavour or freshness. It is true that the inventors of some of the newer methods claim that such a thing is possible, but although I have made a great number of experiments I have never yet tasted a preserved egg that could not be easily distinguished from one that was quite fresh. It is, therefore, not only dishonest, but it is bad business, to try and dispose of preserved eggs as new-laid. Very often this is done, I know, but it is a foolish proceeding, and one that is bound soon to react upon the seller.

THE LIME AND WATER-GLASS METHODS

The lime, salt and water method of preservation is the oldest, and it still takes a lot of beating. The only drawback to it is that it has the effect of making the shells rough and brittle—so brittle, in fact, that they cannot be boiled. So long as preserved eggs are honestly described, however, this is really no drawback, for it is the interior of the egg, not the exterior, with which one is concerned.

A mixture is made of 20 gallons of water, 1 gallon of salt, and 4 gallons of fine slaked lime. It should be allowed to stand for twelve hours, so that the sediment may fall to the bottom, for only the clear liquid must be used. The eggs are placed in tubs or glazed jars, and the preparation poured over them. The eggs must be completely covered, and it is all the better to have two or three inches of the liquid above the top layer. It is a good plan, too, to add a little lime from time to time, in order to keep the mixture sufficiently strong. This can be done quite easily by stretching a piece of butter muslin over the jar, allowing it to dip in the centre, with a little lime resting on it. The liquid can then take more lime into solution as it is required.

The water-glass method is another very popular and excellent method of preserving, and possesses an advantage over the previous one by reason of the fact that the shells are not affected in any way. The eggs are treated in just the same way. They are placed in a tub or jar, and the liquid is poured over them. Water-glass can be obtained from any chemist, and, as a rule, directions are inclosed with each packet regarding the amount of water to be added. Sometimes it is necessary to add five times as much water by bulk or by weight; sometimes ten. This depends on the strength of the particular sample, and the directions must, therefore, be followed carefully.

SALT, AND OTHER METHODS

Few people know that it is possible to keep eggs quite well for two or three months by placing them in common salt. For home use this is quite a good way, but as the salt absorbs a little moisture from the egg, causing the contents to rattle somewhat, it is not a method that can be recommended when the eggs are for sale. In the bottom of a box a layer of salt is placed, then a layer of eggs, another of salt, and so on till the box is full. Both the lid and bottom should be screwed on, the former in order to prevent unduly shaking the eggs, the latter in order that when the eggs are required for use, the bottom can be removed and the stale ones used first.

Smearing an egg with grease, lamp-black, or soot are all old-fashioned methods, which answer fairly well, but which are not recommended when the eggs are for sale.

Perhaps the best, but generally not a practical, way of preserving eggs is in cold storage. The eggs should not be actually frozen, as this is liable to crack them, but they should be merely chilled. Eggs preserved in this fashion retain a good deal of their original flavour, and when they have been carefully chilled by an experienced person their quality is but slightly affected.

CHAPTER XX

DISEASE AND ITS PREVENTION

No effort should be regarded as too great to insure good health in the poultry-yard. Once disease starts it is difficult to say where it will end. Prevention is ten thousand times better than cure. There are, of course, a score or more causes of ill-health among fowls, but there are a few which may be specially mentioned, since they are by far the most common. These are :—

1. Forcing growth.
2. Unsuitable foods or overfeeding.
3. Unsanitary houses.
4. In-breeding.
5. Lack of exercise.
6. Tainted soil.

FORCING GROWTH

A great deal is expected of the modern hen, and this is always very liable to encourage disease unless the greatest care be taken. To try and force the growth of birds that are intended later on for breeding purposes is a great mistake. Slow development is an essential factor towards the building up of a stout frame and sound constitution. Pullets or cockerels that have been unduly forced very rarely throw healthy offspring.

When the chickens are to be killed immediately they reach a market size there is no objection whatever to forcing development. As a matter of fact such a plan is recommended, for the sooner that they can be brought into a suitable killing condition the better. But with birds for breeding purposes such a plan is fatal to success.

It must not be forgotten in this connection that many of the diseases from which fowls suffer are hereditary, which is to say, that the tendency to contract the complaint is transmitted from the parents to the progeny. The first care of every poultry-keeper should be, therefore, only to select birds for the breeding-pen which are quite healthy. Never mind how excellent a bird may be, either from a utility or a fancy standpoint, don't use it as a breeder if it has suffered from an organic disease. This doesn't mean that you must reject a bird which has had a cold, been crop-bound, or suffered from a simple complaint. But it does mean that you must reject a bird that has had liver disease, tuberculosis, or a disease of that nature.

UNSUITABLE FOODS AND OVERFEEDING

The feeding of unsuitable foods is also responsible for a good deal of ill-health. Sound food only should be supplied; it should not be provided too liberally, and it should be remembered that certain foods which are suitable in winter are dangerous in summer.

Particularly would I utter a word of protest against the use of maize during warm weather. The effect of maize or Indian corn is to cover the carcass with a layer of greasy fat, which is really a waste product, since it serves no useful purpose, the bulk of it disappearing in the cooking, transforming what was apparently a plump bird into an emaciated specimen. There are two, but only two, occasions when maize may be recommended, namely, during very cold weather and while a hen is sitting. In both these cases its heat-forming influence is useful.

Overfeeding, too, is a very common cause of disease. Seldom do fowls actually die as a direct result of overfeeding, but the foundation for future troubles is laid, and the birds are much more liable to illness than are those in a lean and hard condition. When laying hens are abnormally fat a large percentage of their eggs is sterile, while the chickens that make a successful exit are weakly and difficult to rear to maturity.

Overfeeding chickens is also a mistake, although the consequences, as a rule, are not so serious, since young stock, possessing the natural activity of youth, are enabled to consume more food without the same injurious effects. Keep your fowls in a lean and hard condition, and they will seldom be troubled with ill-health.

UNSANITARY HOUSES

There has been a great improvement during the last few years as regards the housing of poultry, and it is only upon a very few places where one finds that the sheds are unsuitable. Particularly important is the question of ventilation, and at all times a gentle current of air should pass through the house, well above the heads of the fowls, for draughts must be avoided. Pure air is of the utmost importance, for experience has fully proved its absolute necessity. Without an abundant supply the birds will inevitably suffer considerably in health.

The poultry-house should be well lighted and quite dry, while it should be kept scrupulously clean. Dirt in any shape or form is injurious to poultry, not only encouraging ill-health, but impairing the egg-producing powers of the hens, retarding the growth of the young stock, and making the birds much more liable to disease.

IN-BREEDING

Many poultry-keepers have only themselves to blame when their fowls are unhealthy, because they are guilty of that extremely foolish practice of using related birds for breeding purposes. This does not, of course, actually cause disease, but what it does do is to weaken the constitutions of the chickens, making them much more liable to any disease that may be prevalent. More than this, it means that when fowls do fall sick they have the complaint much more seriously than do the offspring of unrelated parents, and there is much greater difficulty in effecting a successful or permanent cure.

Among the many other disadvantages of in-breeding are that a large percentage of the eggs is likely to be infertile, causing much loss and waste of time; the chickens are delicate and are difficult to rear; and they never become good birds.

LACK OF EXERCISE

Another frequent cause of unhealthiness is lack of exercise. Lazy birds are never nearly so healthy as those which are active. Sometimes laziness merely results in reduced egg-producing powers or failure to fertilise the eggs properly. Very frequently, however, it is a direct cause of disease. Fowls should be encouraged in every possible way, therefore, to take plenty of exercise. This applies to young chickens as well as to adults.

There are many ways of encouraging exercise, even among those birds which are kept in strict confinement. Burying the grain in chaff or straw; suspending a cabbage or half-root to within a foot or so of the ground; and burying a piece of meat a few inches below the surface, all afford capital exercise, and assist in keeping the fowls healthy and strong.

TAINTED SOIL

Foul ground is one of the most frequent causes of ill-health among fowls, and many of the most serious poultry epidemics we have had have been the direct result of it. When the soil becomes very foul it is practically certain to cause disease, if not death itself; while if it becomes even slightly tainted it is inevitably responsible for slow growth, stunted development, and, later on, for poor laying. Liver disease, tuberculosis, gapes, and several other complaints from which fowls suffer, are more often than not directly traceable to the impurity of the soil.

As long as the grass within the poultry-run can be kept growing strongly and vigorously the risk of foul ground is practically non-existent. The danger arises when the grass becomes worn, and bare patches make their appearance. This is when the greatest attention is necessary, for if the dung is allowed to collect on such places there is no vegetable growth to use it up, and in a short space of time it becomes very foul.

I always think it a good plan when fowls have to be kept in confinement to have a small part of the run, preferably that in the immediate vicinity of the house, laid down in gravel, and rolled hard. Then if the gravel is swept regularly once or twice a week the bulk of the droppings will be collected. Apart from the fact that such a plan helps very materially in maintaining the purity of the soil, the dung thus collected is a valuable asset.

It would be very helpful indeed if it were possible to give some figures as regards the correct number of fowls that can be kept upon a plot of land measuring so much by so much. But, unfortunately, no hard-and-fast rule can be laid down in this connection. There are many factors which must be taken into consideration before a decision can be come to. The nature of the soil, the time of the year, and the breed of fowls are all-important points that must be reckoned with. A light, porous soil, for instance, can carry a much larger number of fowls per acre than one that is heavy. Some breeds, too, are more vigorous than others, and consequently require more space. Further, during the spring and summer, when the soil abounds in vegetable growth, the land may with safety be more heavily stocked. The true test—and the only test—is the condition of the grass. If it is growing satisfactorily, one may be pretty sure that all is well; if, on the other hand, it is worn and looking unhealthy one may be pretty sure that it is becoming foul.

The right thing to do, of course, is not to allow the soil to become foul. But if the soil has become foul steps should be taken at once to put it right. To begin with, the birds should be removed immediately. Then, if the ground is not in a particularly bad state, a light dressing of gas-lime, or a 1 per cent solution of sulphuric acid, should be applied, which generally has the desired effect without doing the herbage any harm. Where the land has got into rather a bad state it should be allowed to lie idle for about a year after the lime or sulphuric acid has been applied, which usually brings it into good condition again. If it is in a very bad state, it is wisest to dig it up and cultivate it for a year or two. Coarse vegetables are about the best thing, as their growth is rather rank, which means a larger proportion of manure is absorbed.

A POULTRY HOSPITAL

No poultry-yard, however small, but should have a room or a shed set especially apart for use as a hospital, into which fowls can be put immediately they show signs of being unwell. Many of the diseases from which fowls suffer are infectious, and unless the patient is isolated the whole flock may become affected. If, on the other hand, a bird is placed by itself immediately it shows any signs of disease, it may save a serious epidemic.

It is also an excellent plan always to keep in stock a supply of simple medicines. Especially is this important when the smallholding is some distance from a chemist's shop. By having medicines handy you may quite easily be able to nip in the bud what would otherwise develop into a serious outbreak of disease. Of course, there is no need to stock a great many remedies, but here are some which no poultry-keeper can get along without: Paraffin, with which to paint the birds' legs in case of scaly leg ; permanganate of potash, which, dissolved in water, makes a very useful disinfectant for treating wounds and sores ; vaseline ; sulphur ; Epsom salts. Whenever a fowl is ailing the first thing to do is to give her half a teaspoonful of salts dissolved in water.

THE MOST COMMON DISEASES

BRONCHITIS. *Causes.*—Exposure to cold or dampness ; may start from cold.

Symptoms.—Rapid breathing ; rattling in throat ; cough.

Treatment.—Correct conditions ; give two grains of black antimony in mash daily ; flax-seed tea to drink. Moisten air.

BLOOD-SPOTS IN EGGS. *Causes.*—Escaped blood from ruptured yolk sac.

Symptoms.—Small clots of blood in eggs.

Treatment.—None if forced feeding is not practised.

BUMBLE FOOT. *Causes.*—Jumping from high roosts, or injuring sole of foot in some other manner.

Symptoms.—Abscess on sole of foot, lameness.

Treatment.—Open abscess, remove pus and wash with bichloride of mercury; bandage.

CANKER. *Causes.*—Diphtheria and roup; from wounds that become infected.

Symptoms.—Cheesy patches in mouth and on tongue.

Treatment.—Wash sores with hydrogen peroxide. Supply green food liberally.

CATARRH OR COLDS. *Causes.*—Improper housing conditions; exposure to cold or dampness.

Symptoms.—Sneezing; watery discharge from eyes and nostrils.

Treatment.—Give red pepper in food; wash affected part with three per cent solution of boracic acid. (See BRONCHITIS.)

CHOLERA. *Causes.*—Filthy conditions; improper foods.

Symptoms.—Bright yellowish or green excrement; severe diarrhœa and thick mucus.

Treatment.—See DIARRHŒA (SEVERE) and DYSENTERY. True cholera very rare.

CONSTIPATION. *Causes.*—Lack of exercise and green food.

Symptoms.—Frequent attempts to evacuate the bowels, vent plugged with hard dry fæces.

Treatment.—Give purgative of Epsom salts or castor-oil.

DIARRHŒA (SIMPLE). *Causes.*—Sour or mouldy foods; mild poisons; too much green food, etc.

Symptoms.—Excrement soft and watery, off colour and offensive.

Treatment.—Mild purgative; feed liberally on middlings and boiled rice. Add little bone meal or powdered chalk to food.

DIARRHŒA (SEVERE). *Causes.*—Severe intestinal diseases; poisons; cholera; intestinal worms.

Symptoms.—Bloody discharge of mucus in excrement.

Treatment.—Purgative of Epsom salts; charcoal in mash; give three grains of subnitrate of bismuth in mash daily.

DYSENTERY. *Causes.*—Putrid food of any sort; bacterial infection; poisons such as lye, paint, etc.

Symptoms.—Profuse diarrhœa of varying colours, accompained by frequent discharges of blood.

Treatment.—See treatment for simple and severe diarrhœa.

EGG-BOUND. *Causes.*—Abnormal eggs; injury or derangement of oviduct.

Symptoms.—Restless; nest visited frequently with unsuccessful attempts to expel egg.

Treatment.—Hold rear of bird over vessel of boiling water; introduce sweet oil into vent with feather or similar object.

ENLARGED LIVER. *Causes.*—Overfeeding of rich foods or those unsuited to conditions.

Symptoms.—Misleading; head dressings turn dark; diarrhœa.

Treatment.—Correct conditions; supply plenty of green food.

FAVUS OR WHITE COMB. *Causes.*—Fungus disease.

Symptoms.—Small greyish white spots on comb, wattles and face; disagreeable odour like musty grain.

Treatment.—Soften scabs with glycerine; paint with tincture of iodine.

FEATHER EATING. *Causes.*—Lack of meat food; external parasites; bad habit.

Symptoms.—Loss of feathers in different regions of body; exposed area usually red.

Treatment.—Supply meat foods and minerals; examine for lice; if vicious habit, kill the culprits.

FROZEN COMB AND WATTLES.—*Causes.*—Exposure to cold.

Symptoms.—Parts become swollen and purplish in colour.

Treatment.—Thaw out by manipulating with greasy fingers. Anoint parts with mixture of 5 tablespoonfuls of vaseline, 2 of glycerine, and 1 of turpentine.

Gapes. *Causes.* Gapeworm attached to walls of windpipe.

Symptoms.—Breathing difficult; frequent gaping as if strangled.

Treatment.—Remove chicks to fresh ground; clean up runs; remove worms with quill or fumigation over carbolic acid.

Indigestion. *Causes.*—Improper or overfeeding; lack of green food.

Symptoms.—Dumpish, inclined to remain inactive.

Treatment.—Correct ration; give three tablespoonfuls of following in every 10 quarts of mash: 1 lb. pulverised gentian, ¼ lb. pulverised ginger, ¼ lb. pulverised saltpetre, ½ lb. iron sulphate.

Leg Weakness. *Causes.*—Improper management; forced feeding; lack of ash in ration.

Symptoms.—Loss of use of legs; knee-joints enlarge and legs sprawl out.

Treatment.—Improve management in every way; give plenty of green food; see that ash contents of ration is correct; ½ teaspoonful of tincture of nux vomica to each quart of water.

Pip. *Causes.*—Usually a symptom of disease of respiratory organs.

Symptoms.—Covering of tongue dry and hard.

Treatment.—Moisten with mixture of equal parts of glycerine and water, add 20 grains of chlorate of potash to each ounce of mixture.

Prolapsus. *Causes.*—Excessive fat in abdomen; derangement of oviduct.

Symptoms.—Abdomen hangs down.

Treatment.—Withhold fatty foods; feed light. None if caused by derangement of oviduct.

Roup. *Causes.*—Generally the aftermath of such diseases as colds, catarrh, etc.; difference of opinion as to specific cause.

Symptoms.—Watery, frothy discharge from eyes; putrid catarrh of nose; eyelids glued together; cavities filled with cheesy matter; canker sores in mouth.

Treatment.—Wash face, eyes, mouth, and nostrils in warm water in which permanganate of potash has been dissolved. Give a roup pill daily. Provide abundant green food.

SCALY LEGS. *Causes.*—Mite.

Symptoms.—Legs become incrusted with rough, whitish, scaly areas. Loss of toes and legs sometimes occurs.

Treatment.—Dip affected parts in mixture of equal parts kerosene and raw linseed oil. Do not get solution on feathers or skin.

WHITE DIARRHŒA. *Causes.*—Transmission of disease from parent stock, by consuming food or water contaminated by infected chicks.

Symptoms.—Dullness and sleepiness; whitish diarrhœa and pasting up behind; drooping wings and general anæmic appearance.

Treatment.—See cause; supply sweet or sour milk to chicks from the very start. Medicinal treatment not practical.

FIRST AID

Although fowls are not so liable to injuries as are larger stock, all sorts of accidents happen from time to time. When they occur they should be attended to immediately; otherwise a slight complaint may quickly develop into a serious one, requiring a great amount of time and trouble to cure, if indeed it is curable at all. It is not, however, always wise to attempt a cure, particularly if the patient is of no particular value. Say, for instance, a two-year-old hen has the misfortune to break her leg. To cure this would entail a great deal of time and labour, and even then it is by no means certain that a cure would be effected. In a case like this, my plan—and I think the right one—has always been to destroy the bird at once, But in many other instances, where the bird is a young and perhaps a valuable one, and the accident not of a very serious nature, it pays to go to some trouble and expense to effect a cure. When young cockerels are living together they sometimes fight among themselves, occasionally doing one another serious injury. It may happen, too, that the cocks from two breeding pens may get together, when usually a fight takes place. The injury they do one another is generally confined to tearing the comb and wattles. Unless the injury is treated at once, it may develop into a serious disease. The prevention of such an occurrence is simple in the extreme. The comb and wattles—and any other part which may have been hurt—should be bathed in warm water, and dressed with zinc ointment or vaseline. This process should be repeated for three or four days until the affected parts are cured.

FROST BITE

During a spell of cold, frosty weather it often happens that the comb and wattles become frost-bitten. Prolonged cold, acting as a chemical irritant, soon impedes and finally arrests the blood circulation in tissues so exposed and thin-skinned as are those of the comb and wattles. These, at first pallid, become congested and blue like a chilblain, and lastly black, in consequence of gangrene. As the parts die they may even drop off. If neglected, the trouble quickly assumes serious proportions. If taken in time it is simple to cure.

In the early stages rubbing the frost-bitten parts with snow may effect a cure. Generally, however, local applications are also necessary. A good preparation—one used in America—is composed of 2 oz. of lard, 1 oz. of quinine, and 3 oz. of paraffin, melted and mixed together to form an ointment to be applied with gentle friction. A preparation which I have often used is made as follows: Beat up an egg, add half a pint of vinegar, 2 oz. of turpentine, and ½ oz. of camphor previously dissolved in 1 oz. of aromatic spirit of ammonia.

These ingredients must be well mixed and some of the liniment rubbed on the comb and wattles daily, taking care that it does not get into the bird's eyes. A third recipe, most useful when the surfaces are broken and chapped, consists of 2 oz. of powdered boracic acid well pounded together with 4 oz. of glycerine, and applied freely and often to the abraded parts. Some cod liver oil in the soft food will do much to keep the birds warm, and render them proof against the harmful effects of keen frost.

INJURIES TO COMB, EYES, ETC.

The most important point to remember when a torn comb, a cut, or a torn eye occurs, is to keep the wound thoroughly clean, and to sew it up carefully without a moment's delay. The wound should be first bathed in warm water containing two or three grains of permanganate of potash, and all foreign matter removed. The latter is of the most vital importance.

The wound should then be stitched up with a surgical needle, and some natural coloured silk. If several stitches are necessary, it is best to make each one quite separate. A little carbolised vaseline should then be smeared over the place, and renewed every morning for four or five days. If the wound is a large one it is advisable to bandage it, but in ordinary cases this is unnecessary.

A DISLOCATED JOINT

A broken leg or a dislocated wing is comparatively easy to cure if the owner is a handy man. The most important point to remember is that such an accident must be dealt with immediately. Delay is most dangerous, for even a few hours may cause the bone to set in a wrong position. The flesh and bones of poultry possess a wonderful vitality, and in a healthy fowl recover in a remarkably short space of time. Perhaps the most common accident of this kind is dislocation of the thigh or wing. And it is one that is, nine cases out of ten, due to rough handling on the part of the poultryman.

The first thing to do is to make a careful examination of the dislocated joint, and to get it back into its right position. When this is done, the bird's body should be bandaged with an ordinary 2-inch surgical bandage in such a way that the limb can't be moved.

A far more troublesome accident to deal with is a broken leg, especially if it be a compound fracture, that is, one where the bone is broken in several places. Unless the bird is a valuable one it is much better to destroy it at once than to attempt a cure.

If a cure is to be effected, the first thing to do is to find the fractured edges of the bone, and fit those together as carefully as possible. It should be remembered that all this time the fowl is suffering intense pain. The edges having been placed together the leg must be put into splints, and lightly bandaged. The bird must then have both its legs tied together, and be laid on its side on some soft straw, where it should remain for about forty-eight hours. At the end of about two days the process of rejoining will have started, when one leg can be released. A bandage should be put round the wings to prevent the bird from fluttering about.

BURNS AND POISONING

These are not very frequent with poultry, but occasionally they do occur. In a serious case of burning or scalding the best thing is to kill the bird. If it is only a small burn, however, it should be treated every two or three hours at first, gradually extending the interval, with lime-water and linseed oil in equal parts. If a burn is neglected at all it will quickly change into a running sore, and be extremely difficult to heal.

If you have reason to believe that a bird has eaten something poisonous, first of all wash out the crop by pouring warm water down the throat; then turn the bird upside down and squeeze out the water. This will probably get rid of any poisonous matter that may remain in the crop. Follow this by administering a strong dose of castor oil. At the same time give a little brandy or port wine as a stimulant. If the nature of the poison is known, an antidote should be obtained from the chemist—he will tell you what to use. Failing this, give the white of an egg and olive oil in equal proportions.

AN EGG-BOUND HEN

Sometimes it happens that a hen can't pass her egg. This may be due to a contraction of the passage, or to an abnormally large egg. The most noticeable symptoms are a frequent visiting of the nest without laying, and a depression of the tail and wings.

The first thing to do is to soften the vent with salad-oil; if this fails, an hour afterwards inject an ounce of salad-oil. Be very careful not to break the egg in making this injection. In more obstinate cases some warm treacle, in which a little chopped groundsel has been mixed, is useful. This should be given in doses of a tablespoonful at intervals of an hour. If this again fails, the vent of the bird should be held over a jug of boiling water in which ten drops of iodine to a quart of water has been added.

CHAPTER XXI

THE MOULT AND ITS TREATMENT

ONCE every twelvemonths fowls cast their old feathers, replacing them with an entirely new set. The period when this change of plumage is taking place is commonly termed the moult, and while the fowls are passing through this stage they cannot rightly be said to be ill, but they are nevertheless in a somewhat critical state, when neglect may have the most serious consequences. If, on the other hand, they are looked after well, they soon regain their usual health and vigour.

The natural time for the casting of the feathers is late summer or early autumn, but fowls vary a good deal in this respect. Some commence early in August, while others do not begin the process until midway in September. It is a great advantage if fowls can be induced to moult early in the season, for then they have completed the process in plenty of time to recommence laying in the autumn, when eggs are scarce and worth a lot of money. If a hen does not begin to moult till the middle of September, and she takes six weeks or two months to complete the change, it means that it is November before she is quite recovered. When this occurs she is very unlikely to commence laying till after the turn of the year.

Every inducement, therefore, should be given to the hens to cast their feathers early in the season, and this can be accomplished by feeding upon a low diet. Early in June the quantity and quality of the food supplied should be reduced, so as to bring the birds into a poor condition. This greatly encourages the dropping of the feathers. The reduction in the food supply must be done very carefully, otherwise the fowls are liable to become too thin.

The moment the moult begins, that is as soon as the first feather is observed to drop, the low-dieting must cease, and the fowls must be fed generously upon a nourishing and feather-forming ration. It is possible by a proper system of dieting to hasten the moult by several weeks, even months. I have on many occasions caused hens to moult early in July, and they have completed the process by the end of August. This gives them plenty of time to recover thoroughly, and to be ready for laying by the autumn.

THE DURATION OF THE MOULT

The length of time it takes a hen to cast all her old feathers and to grow her new supply depends very largely upon her age. Pullets in their first season very often take no more than four or five weeks, whereas an old hen—say, one in her third or fourth year—may very possibly take three months, while I have known cases in which the period has extended over sixteen weeks. This is another advantage, to add to the many, of depending upon young stock in the breeding or laying pen. The period during which the moult is taking place is practically a waste time, and the sooner it is over the better.

During a fine, dry summer the moult is completed much more rapidly than it is during a spell of wet weather. Fowls which cast their feathers early pass through the process much quicker than do those that commence later in the year, since all the new feathers, in the latter instance, have not formed before the cold weather arrives. Fowls that are in a fat condition take much longer to complete the change than do those which are in a lean, hard condition.

GENERAL TREATMENT

While the moulting period is in progress it is necessary to look after the fowls well, since any neglect may have very serious consequences. If it does nothing else it certainly prolongs the period very considerably. It is a great advantage to have a covered-in shed attached to the roosting quarters, for the birds must not be allowed out on wet or cold days. If there is no scratching-shed it means that during bad weather the fowls have no option but to remain in their sleeping quarters, a notoriously bad plan. A scratching-shed—a capital one of which can be erected at a very small cost—overcomes this difficulty.

While exposure to rain or cold prolongs the moulting period, so does exposure to too much sun. This is a point seldom realised, but nevertheless it is a fact. Protection should be provided from too much heat, and shelters should be erected under which the fowls can go. Two hurdles fastened together with straw between, flake hurdles, a bundle of gorse or twigs, or small canvas shelters, all answer the purpose admirably.

FEEDING MOULTING HENS

Everything of a forcing or fattening nature must be studiously avoided. Green food in large quantities should be given freely, for it possesses manifold advantages. It has a cooling effect, and helps to allay the feverish condition of the body, the temperature of which is several degrees higher than under normal conditions. It is easy of assimilation itself, and assists in the digestion of other foods. In addition to this it contains a large proportion of the elements that help to form the new plumage.

The most suitable grains during the process, especially when the new feathers are appearing, are oats and wheat, the former for preference; of soft foods, pea or bean meal and middlings are the ones I recommend. Small quantities of animal food may be used, though this should only be given once a day, provided that plenty of vegetables, either cooked or raw, are available; otherwise the meat has a tendency to prove too heating and causes irritation to the skin during the casting of the feathers. The foods enumerated are nitrogenous and form flesh and feathers, they maintain stamina, and keep the birds fit and well, while they are in no wise fattening. The foods which should be avoided, since they tend to prolong the moult, are maize and hemp seed. They are too oily and fat-forming.

In the drinking water supplied to fowls during the moulting period there should be added a little sulphate of iron and sulphuric acid. Two pieces of the former, the size of filberts, and ten drops of the latter added to a gallon of water, assist the birds very considerably during this somewhat trying stage.

THE IMPORTANCE OF CLEANLINESS

Quite a common, though as a rule unsuspected, cause of the prolongation of the moult is that the fowls are troubled with parasites. This is a great handicap, and causes the victims much suffering which might easily be avoided. Before and during the moult fowls should be examined, and if they are so affected they should be thoroughly washed with a lotion made from quassia chips or with petroleum.

A dust bath should also be near at hand, and, even if there are no vermin to be destroyed, the dusting on the bare parts of the body will have a soothing effect.

The male birds should be removed from the pens during the moulting period, and kept apart until the new feathers are completely formed. The separation is beneficial to the males in that their vigour is restored before the breeding season is again in full swing, while the hens feel the benefit owing to the fact that the tender new plumage is protected, and the birds are strengthened before having to submit to the attentions of the male bird.

CHAPTER XXII

TWO BY-PRODUCTS AND TWO VICES

POULTRY MANURE

THE value of poultry dung is rarely appreciated by the poultry-keeper, yet it is one of the most concentrated fertilisers we possess. The man who is a poultry-keeper pure and simple is not so much to blame if he fail to realise its value; but the man who is growing crops and who is always in want of a good fertiliser for them, is guilty of almost criminal folly if he waste this most valuable by-product of the poultry-yard.

From fifty-four to fifty-six adult fowls will produce in twelve months as nearly as possible a ton of air-dried poultry-manure. The same number of fattening birds, whose dung is very rich and plentiful, will produce about half as much again. Of course, the value of the manure must depend to a large extent upon the foods consumed by the fowls. Heavily fed fowls will naturally produce a larger quantity, and it will be richer.

HOW TO STORE

One very good method of storing poultry dung is to place a thin layer of earth on a brick or cement floor as a basis for the compost. On this is placed a layer of poultry manure, and again a layer of earth on top. Earth must always be uppermost. This prevents much of the value being lost in the air. Another method is to have a rack of shallow boxes, into which the scrapings from the dropping-boards and from under the fattening cages can be put. These should be in the open, but covered, so that the rain cannot penetrate. Another way is to place the droppings in a barrel just as they are. This is not so good a method as the two previous ones.

Poultry dung is very concentrated, and before applied to the soil it should be adulterated. One very good mixture is seven parts by weight of poultry dung, one part mineral superphosphate, two parts gypsum, and five parts fine earth or sand. A plan adopted by some market-gardeners is to convert the manure into a liquid form. To do this the droppings are placed in a barrel until half full, when it is filled up with water. The barrel is covered on the top with sacking or a board, and allowed to stand until the liquid is required for use.

POULTRY FEATHERS

There is always a very good demand for poultry feathers, and a source of profit is being neglected if they are thrown away. Their value is considerable and on no account should this by-product be neglected. The prices obtained vary greatly, according to the locality, but in every instance the feathers should be properly cured and then marketed. Feathers from fowls, ducks, geese, etc., must be kept separate, and the long tail and wing feathers should also be placed by themselves.

As the feathers are collected they should be sprinkled with a weak disinfectant and stuffed loosely into large paper bags. Then place the bags in an oven sufficiently hot to scorch a piece of paper in five or six minutes, and leave them there until the paper begins to brown. After baking the feathers take them out very lightly, beat them in order to get rid of dust, and place them in fresh bags made of waxed paper, and store in a dry place until sufficient have been collected to sell. Care should be taken to see that there are no pieces of meat adhering to the feathers.

THE FEATHER-EATING VICE

By no stretch of the imagination can feather-eating be called a disease. It is merely a bad habit. At the same time it gives a great deal of trouble in many poultry yards, disfiguring the birds and reducing their value.

If a bird is caught in the act of pulling out another's feathers, and if it be not a bird of great value, the best plan is to wring its neck at once, because the habit is very easily acquired by the other fowls until the whole flock becomes affected. If, on the other hand, the bird be a valuable one, it is worth taking time and trouble to cure it.

One of the most common causes is uncleanliness. In yards where the strictest attention is not paid to this very important matter the birds become infested with vermin, and these set up irritation, to overcome which the birds peck at their own or another's feathers. Every month or six weeks, therefore, fowls of all ages should be dusted with a disinfectant powder, particular attention being bestowed on the parts under the wings and on the breast. The sleeping quarters should be regularly whitewashed, and the perches cleaned and their ends dipped into paraffin oil every few weeks. With the lime and water there should be added some soft soap and paraffin oil, in the proportion of half a pound of the former and a pint of the latter to every four gallons of whitewash. The effect of the soft soap is to make the mixture stick firmly to the walls; the latter is to destroy all vermin.

Another cause of feather picking is idleness. Particularly is this the case during the winter months, when the fowls cannot wander about and have to remain under shelter most of the day. Provided there is a scratching-shed attached to the house the difficulty is easily overcome. If the floor is covered with straw or chaff, and the grain always scattered among it, the birds are afforded plenty of exercise and occupation. A mangel or cabbage should be suspended from the roof, just out of reach of the birds, as the constant jumping up to peck at it provides them with an abundance of work and amusement.

The third common cause is lack of animal food in the diet. This again is very easily overcome. To the morning meal of mash a little granulated meat should be added; cooked lean meat, chopped up, answers the purpose quite well.

SOME REMEDIES

The greatest possible cleanliness should be observed in everything that comes into contact with the birds, either young or old. Plenty of opportunity for exercise should be provided. And a liberal allowance of meat or animal food should be supplied.

A remedy for feather eating, at one time very popular but now rarely adopted, is to pare the inside edge of each mandible in such a manner that when the bird grips a feather it slips through the beak; the fowl thus finding it impossible to pull it out very quickly gives up the attempt. A hairpin passed through the nostrils in such a way that it cannot slip, with the ends twisted so that one projects backwards and the other forwards, is a method recommended by some, but it always appears unnecessarily cruel. Each time the culprit tries to take hold of a feather it pricks the other bird with the hairpin, so causing it to jump away. There are other methods, such as cutting the lower mandible away or painting the birds with an evil-smelling preparation.

EGG-EATING

A considerable loss occurs in many poultry yards through the hens eating their own or others' eggs. And the worst of it is that it may continue for some time without being discovered, since everything, shell as well as contents, is consumed.

The most common cause of egg-eating is that the birds are receiving too small a supply of shell-forming material. They peck at the eggs in order to satisfy their craving, and so get a liking for the egg's contents. A liberal supply of oyster-shell frequently overcomes the difficulty. An insufficient number of nest-boxes also causes trouble at times. Eggs are laid in the litter and are broken. A hen is attracted to them, samples them, finds them attractive, and acquires the egg-eating habit. Once the taste is acquired, it is not altogether easy to counteract it. The time-honoured plan is to blow an egg, and refill it with a mixture of cayenne pepper and mustard. Once a hen samples such a preparation she is not likely to attempt the experiment again. At the same time, this method is somewhat drastic, and prevention rather than cure is recommended.

The birds should be liberally supplied with shell-forming material, a sufficient number of nest-boxes should be provided, and the hens should be encouraged to take as much exercise as possible, for very often the vice is caused through idleness.

CHAPTER XXIII

BANTAMS AND THEIR MANAGEMENT

WHILE in many respects the treatment of bantams is the same as that of ordinary fowls there are a good many points of dissimilarity. Some of these are of comparatively small importance, but some of them, on the other hand, make all the difference between success and failure. Provided that the laws of breeding are attended to very carefully, and that a vigorous strain or breed is selected, bantams are really of no more trouble than ordinary fowls. The reason they are sometimes so delicate, and the chickens so difficult to rear, is owing to the fact that the strain is not a robust one, or that inbreeding has been carelessly carried out. It is of the utmost importance that unrelated breeding stock be used ; otherwise there is certain to be trouble.

BANTAMS IN BELGIUM

As everybody knows, Belgium is a small country where, in the days before the war, every square inch of ground was cultivated. In a large number of cases the holdings were very small indeed, while in the towns the gardens more often than not occupied very little space. This was probably the chief reason why Bantam breeding was taken up so greatly in that country. During the last decade Bantam breeding has extended enormously, owing, no doubt, to the vast increase in the industrial and commercial population. Not only have the old varieties advanced in popularity, but several new breeds have been introduced, some of which possess excellent economic qualities.

A very powerful club was founded which did a great deal to encourage Bantam-keeping among those living in the towns and cities where larger fowls were unsuitable. It is true there is little or no demand for Bantam chickens or eggs in the open market, for both are too small in size. But this, which at first sight appears a drawback, is in reality an advantage.

One of the dangers threatening our working population is deprivation of suitable foods, and when the income is strictly limited the temptation to dispose of the produce is very great indeed. In the case of Bantam chickens and eggs, however, there is no such temptation, with the result that the children benefit. The households are supplied with new-laid eggs, and occasionally with chickens, and while both are small they are rich in quality and very nourishing. This is quite a new aspect to the question, and I think it is one that deserves very careful attention. I am not going to recommend Bantams in place of ordinary fowls where there is plenty of space for the latter, but I do think that the matter is one which is worthy of experiment.

BANTAMS AS UTILITY FOWLS

We have always regarded Bantams as purely fancy fowls. The idea of their being valuable for utility purposes is altogether a fresh one. It is quite possible that the Belgians have led the way in what may prove to be very great development. In all parts of our own country towns are growing, and the population is increasing rapidly. Notwithstanding this, however, there is a tendency at the present time to insist upon larger gardens for the working-classes, or, in cases where this is impossible, upon allotments. Thus intensification becomes more and more necessary.

A dozen Bantams can be kept in health and vigour upon the same space as two or three larger fowls; thus the possibilities of everyone who possesses a garden, even quite a small one, becoming a poultry-keeper seem easy of accomplishment. It must be remembered in this connection, however, that the produce at the present time is of little or no value for marketing purposes, but merely for home consumption. When the day comes, as come it must sooner or later, when eggs are sold by weight instead of by number, it is quite probable that there will be a good demand for these small eggs and chickens. Nowadays, however, they are only of value for the home.

A branch of poultry-keeping which is growing every year, but which at present is almost entirely in the hands of the foreigner, is that of the production of Petits Poussins. These are small birds, weighing from six to ten ounces, which weight they usually attain, provided that the breed and management are right, in a month or six weeks. The trade is a lucrative one, since the birds must be ready during April or May, when chickens are somewhat scarce. Excellent prices, however, are obtainable for good birds, and the branch is one that pays extremely well. Under certain conditions I believe that this trade is specially suited to those who have only a limited area of ground available, since I think it is quite possible that Bantams might prove excellent for this trade. They would, of course, have to be from ten to twelve weeks old, but it is quite certain that the flesh would be full and of a fine flavour. Whether the trade will prove profitable remains to be proved, and is really a matter for experiment. I am inclined to think that it would pay extremely well.

THE BEST BREEDS

There are so many breeds of Bantams that it is difficult to say which of them are likely to be the most suitable for utility purposes. Moreover, they have never been regarded from this point of view, with the result that one has no data to go upon.

So far as my own experience goes, I should place the Game Bantams first, followed by the Hamburgh, the Orpington, the Rosecomb, and the Scotch Grey.

The Belgians consider that the Barbu Nain d'Anvers, or the Antwerp Bearded Bantam, is the best for utility purposes. The hens are reputed to be excellent layers, tame and hardy, while they thrive well in the strictest confinement.

HOUSING ACCOMMODATION

As I have indicated above, Bantams require very little room, and so long as the houses and the runs are kept scrupulously clean they thrive extremely well in a very restricted area. While a grass run is distinctly advantageous, it is by no means absolutely necessary.

A short time ago I was visiting a very successful Bantam-yard, where all the birds are housed in small lean-to sheds, each measuring 3 feet square, with a covered-in run 6 feet by 3 feet. A cock and three hens are kept in a house and run of these measurements, and they seem as healthy as can be desired. At the same time, a grass run should be provided whenever the conditions allow.

There is no better form of housing than in small portable sheds, with a small run attached. These should be moved every day to a fresh spot, the same plan being adopted as with brooders and coops.

The general principles of housing must be observed, for while the houses are small this is no reason why they should not be thoroughly ventilated and well-lit. Pure air, and plenty of it, is an essential factor towards successful results, and there should always be an arrangement whereby the used-up vitiated air passes quickly away, allowing fresh to take its place. The house should contain a comparatively large window, which should open, so that when the weather is warm it may remain open all night. Draughts must be avoided, of course, for these are worse, if anything, than an insufficient supply of air.

A NOTED BANTAM-BREEDER'S PLAN

I recently asked a friend of mine, a man who is one of the best-known breeders of Bantams in this country, to send me a short description of his methods of management. He replied as follows: " In my case many of my

Rosecombs are kept in small, movable, covered-in pens, about 3 feet long by 2 feet wide, and 2 feet 6 inches high in front, sloping down to 1 foot 8 inches at the back, each pen consisting of a house 1 foot wide, with a run 2 feet wide. The whole of the front of the sleeping-house consists of the door, in which a window is inserted, and the run is boarded up 6 inches high, the remainder of the front being wire-netting covered with unbleached calico. The house part has a boarded floor, kept covered with fine peat moss or sawdust, and the birds pass into the covered run through a hole in the partition. My cockerels are placed in these pens as soon as ever they are fit to leave the hen, either in pairs or singly. I find they do not fight as they would if left in a flock, while by keeping the cockerels in these small pens they are much tamer than if housed in large pens or at liberty, besides which they are much more easily handled and trained for the show pen.

"The breeding pens consist of lean-to covered-in structures, boarded 18 inches high in front, and the remainder covered with wire-netting, in each of which is a sleeping-house, the floor of the pen being covered several inches deep with dry leaves, earth, peat moss, or chaff. Some of my pens are connected with a grass run, to which the birds have access on fine days."

FEEDING BANTAM CHICKENS

Some Bantam-breeders advocate the dry method of feeding, but the majority favour the older system. I think I am correct in saying that nearly all the most successful men prefer the latter method. Probably they are right, since there is no advantage in hatching Bantam chickens very early in the season, the time when the dry system is so advantageous.

Referring once again to my friend's letter, from which I have quoted above, he states that he finds the more satisfactory plan is to combine the two methods—the dry and the moist. The first feed should consist of hard-boiled eggs, chopped finely (shells as well), mixed with coarse oatmeal, and given every two hours, and continued for the first two or three days. For the next few days, as a soft food, boiled rice may be given. To cook this properly the rice should be put into a basin of milk, or milk and water, the basin being placed in a saucepan of water and the rice steamed until the grains have swollen to their fullest extent without adhering to one another ; the grains should then be rubbed in oatmeal until dry.

At the end of a week or ten days the feeding may be varied with bread soaked in milk and squeezed as dry as possible, and for a change, biscuit meal may be used. For dry food a mixture of canary seed, millet, broken peas, rice, and wheat is best, and this should be given alternately with the soft food.

Particular care should be taken to see that the soft food is never sloppy, and that all food is placed in troughs or on pieces of board, only sufficient food being given for each meal.

Adult Bantams may be fed on any of the foods I have mentioned, but the great secret in keeping them in health is to ring the changes as much as possible in feeding, not forgetting a plentiful supply of grit and green food.

CHAPTER XXIV

A SIMPLE SYSTEM OF BOOK-KEEPING

EVERY poultry-keeper should keep a careful and strict account of his operations, showing receipts and expenditure and enabling him to draw up at the year's end a Profit and Loss Account. This will tell him what profit he has made, or, more important still, if he has not succeeded, show where the loss arises. His Balance Sheet will reveal the financial position. The simpler the method the better, so long as it is correct. Figures which represent actual facts never deceive. Absence of these often leads to misconception and disaster.

THE CASH BOOK

Where all the transactions on both sides are for cash only one book is necessary. This should be either one of the foolscap analysis books with columns, as follows, on each page: (1) date, (2) remarks, and (3) six ruled for cash, or an ordinary faint-line foolscap book can be ruled in the same manner. If credit is taken or given a small ledger should be kept in which purchases and sales are entered under individual names, together with cash paid and received as the accounts are discharged wholly or partly on either side. Money is not recorded in the first book until it actually passes, and it must always agree in both the cash book and the ledger.

The left-hand page at each opening of the cash book should be devoted to money received. Ordinarily only five of the six cash columns need be used, unless a trade is done in eggs for hatching and stock birds and it is desired to show these separately. Each column is named, showing what it includes, as follows, for a week when operations are in full swing :—

Date.	Remarks.	Total Cash.	Eggs Sold.	Poultry Sold.	Supplies to household.	Sundries.	Eggs for hatching.
1917		£ s. d.	s. d.	£ s. d.	s. d.	s. d.	s. d.
May 1	20 Eggs, house . .	0 2 6	—	—	2 6	—	—
,, 3	95 Eggs sold, 2/- /.	0 15 10	15 10	—	—	—	—
,, 3	Smith's a/c . . .	2 1 9	—	2 1 9	—	—	—
,, 4	12 Eggs, sitting . .	0 3 6	—	—	—	—	3 6
,, 4	Loan Broody Hen .	0 2 0	—	—	—	2 0	—
,, 6	2 Chickens, 4/6 . .	0 9 0	—	0 9 0	—	—	—

The first cash column represents all the money received during the week inclusive of the eggs supplied to the household, but charged at a lower price than those sold, and Smith's account for poultry supplied on credit. Additions of the five other columns must correspond exactly with the amount in Total Cash column.

The right-hand page at each opening of the cash book is devoted to payments, and is divided in a similar manner. Where all the work is done by the smallholder and his family, there will be no wages to pay, and any special work which may require assistance may be entered under Sundries, or, if in the building of houses, under that head. So far as rent and taxes are concerned, as the poultry upon a smallholding are only part of the operations and will give to the land a greater value in manure than the rent of any portion allocated to them, no rent should be charged, or not more than the proportion of that actually occupied. The divisions will be as under :—

CASH PAYMENTS

Date.	Remarks.	Total Cash.	Rent and Taxes.	Food.	Eggs and Poultry.	Houses and Appliances.	Sundries.
1917		£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	s. d.
May 1	1 Brooder. . .	2 5 0	—	—	—	2 5 0	—
,, 2	Carriage . . .	0 2 0	—	—	—	—	2 0
,, 5	1 dozen Chicks .	0 8 6	—	—	8 6	—	—
,, 6	Food-grain . .	2 1 0	—	2 1 0	—	—	—
,, 6	Repairs . . .	0 4 0	—	—	—	—	4 0

Here again the first cash column is equal in amount to the others combined. Expenditure for brooder and chicks are on capital account and will appear in valuation at the year end.

As each page is filled up every column should be added up and carried forward to corresponding positions on the following pages, carefully checking the total cash column with the other totals on the same page, so that errors, if any, may be corrected.

At the end of the year, when all the columns are totalled and ruled off, there will be represented the full season's trading. This, however, will not represent the profit and loss account if there are any outstanding debts on either side. Therefore each account in the ledger must be squared and the balances carried forward.

The account may be made up as follows :—

BALANCE SHEET, DEC. 31, 1917

Dr.	£ *s.* *d.*	£ *s.* *d.*	*Cr.*	£ s. *d.*	£ *s.* *d.*
To Valuation, Jan. 1, 1917:			By Eggs sold and used . . .	40 0 0	
Houses and Appliances . .	30 0 0		By A/cs unpaid .	15 0 0	55 0 0
Stock 50 Birds, @ 6/- . .	15 0 0		By Poultry sold and used .	15 0 0	
Food in Store .	5 0 0		By A/cs unpaid . .	5 0 0	
		50 0 0			20 0 0
			By Settings sold		2 0 0
To Food grown and purchased.	25 0 0		By Sundries		3 0 0
To Bills unpaid .	10 0 0		By Valuation,		
		35 0 0	Dec. 31, 1917	£ *s.* *d.*	
To Fowls, etc., bought . .		5 0 0			
To House and Appliances .		10 0 0	Houses and Appliances . .	40 0 0	
To Sundries		5 0 0			
To Balance profit . . .		46 0 0	Less depreciation . .	5 0 0	
				35 0 0	
			By Stock, 100 Birds @ 6/- .	30 0 0	
			By Food in Store	6 0 0	
					71 0 0
		£151 0 0			£151 0 0

On the year's transactions the profit thus represented for the poultry work would be £46, not taking into account anything for rent and labour. It is assumed that the older birds had been got rid of before the end of the year, and that the stock on hand is one and two year olds.

The valuation on December 31st would be carried forward into the following year.

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